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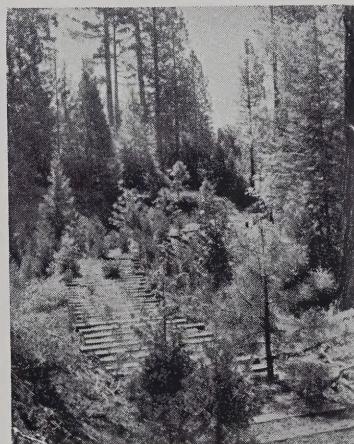
LOGGING RAILROADS
OF THE WEST



LOGGING RAILROADS OF THE WEST

BY

KRAMER A. ADAMS



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INTRODUCTION

The highball signal was two blasts of the steam locomotive whistle. For half a century, it was the most important sound in the West.

Assaulting the stillness of the noblest forests on earth, it gave its name to an entire era of frenzied activity in the lumber industry. The whistle signalled the progress of Man's battle against America's last timbered wilderness. The fortunes of men and cities were based on its vaporous promise, and it heralded the course of empire.

The falsetto of the whistle was part of a deafening chorus made up of clanging machinery, restless steam and groaning wheels. The log-hauling locomotive which carried these improbable noises to the forest was usually a smoky, dangerous and unkempt collection of steel and wood parts which should have been left on the rip track long ago.

She was a lovable woods tramp called something like "Betsy," "The Amazon" or "The Coffee Grinder." Any other civilities directed her way were inspired solely by log-hauling ability, not speed or appearance. Often, she was scorned as a caricature of the coldly efficient engines on the nearby passenger lines. Yet without her, the development of the West would have been delayed and the story of the timber industry a little less colorful.

In daring attacks on the slopes of the Sierras, Bitterroots, Cascades and Rockies, the steam pot chugged into history's most difficult logging terrain. Where railroads had been unthinkable, she ventured boldly on slippery, third-hand rails. If the track wasn't level, it was shimmed up with wood slabs from the lumber mill.

Across creaking wooden trestles and up grades no mainline engineer would attempt, she brought loaded log cars down to the mill day and night, the red hot glow of their screeching wheels visible a mile away in the dark.

Curves were so sharp that the factories of Baldwin, Heisler, Davenport and a dozen others were hard put to produce powerful engines that would stay on the logger's tracks. Lumber, logs, iron and steel were used for rails and the gauge was somewhere between 21 inches and 9 feet.

In her nine decades, the logging locomotive proved that there was no place too remote--no terrain unconquerable--no virgin forest safe. Across desert and swamp, water, snow and ice, she pursued the timber.

The logger properly called her a locomotive instead of an engine, to avoid confusion with other machinery used in the business of getting logs. To him, the locomotive was the center of life. She bore him to

work in the woods and brought out the hot mid-day meal. At times the homeward-bound crew car was a refuge from the bitter weather by which Nature fought back at the bold men who presumed to hack away at the biggest plants on earth.

The logger ate and slept on the rails in camp cars that were shuttled from place to place. The downhill tracks beckoned on payday and took him closer to the city skid road where the rigors of woods life could be drowned out in an orgy as lasting as his hard-earned wages.

The tracks of the logging road led from the timber cutting site to the nearest mill, log pond or booming grounds. The railroad operator's mission was to deliver the logs down the hill as quickly and cheaply as possible.

In the attempt, an unbelievable assortment of obstacles was placed in the way by Man and Nature. Slides, floods, earthquakes, storms, fire, snow and rain dealt terrible blows to the logger's flimsy efforts to span the forest. Derailments, wrecks and explosions made railroad logging one of the most dangerous of all occupations. Among other hazards were wandering bears, deer, elk and cattle on the right of way. Indians fired on the log trains and dynamite on the tracks was used by unfriendly strikers to drive home a point.

More often it was disaster of a financial nature which stalked the railroad show. Anyone with a few hundred dollars and access to timber could make a down payment on a used locomotive and start his chance. Some succeeded in the gamble, but many more lost, and the locomotive was destined to change hands again. Smarter operators ran their trains across the county line to avoid the sheriff. On other occasions, the transfer of ownership was accomplished in a poker game.

There were 3,000 locomotives used on as many railroads which came and went in the tumultuous first century of Western logging. Most of them were ugly, noisy and certainly not the ladies they were built to be.

She might once have been the pampered queen of a mainline, but now she snorted through the forest on a diet of wood, coke, coal, kerosene, oil, briquettes, electricity, gasoline or borrowed steam—whichever was cheapest. Water for her boiler often came from the handiest creek.

In form, the locomotive was as varied as her duties. She was a sleek new product of the Baldwin Works, a converted gasoline truck

or a remodeled threshing machine. In the early days, she might have been a homemade rig, constructed mainly of logger's ingenuity and kept together by baling wire. In no other type of service was there such a variety of motive power.

Only superlatives can be employed to describe the 90-year pageant that was Western railroad logging. There was the shortest railroad in the world, and the steepest one. Logging roads claimed the most expensive mile in history, the highest wooden trestle and the broadest track gauge. There was the longest and steepest incline railroad, the curviest right of way and the oldest regularly operating locomotive.

Amidst the most beautiful scenery in the Nation, the western logging railroads wound over stumps and through the trees on the most dangerous steel pathways that ever existed.

Train schedules were set by the sun, the tide, the barometer or smoke signals from another locomotive on the track. Trains ran a reputed 30 hours each day in and out of such mill towns as Six Bit Gulch, Calif., Remote, Ore., Pysht, Wash. and Big Blackfoot, Mont.

Many of the log-haulers were common carriers, whose passenger trains never sold a ticket; indeed, did not have tickets to sell. Others carried presidents and kings, movie stars and tramps into the grandest forests on earth.

The loggers called them by such titles as the "Stump Dodger," "Knothole Central," "Old Slow and Easy" and "The Skunk Line." Like most nicknames, the unflattering terms were born of familiarity and used with affection.

Few remain to mourn the highball days. The wasteful cut-out and get-out logging which the railroad made possible has been replaced by reason in the handling of America's forests. Sentimentalists alone will care that the steam locomotive has already made her last spur run and exists today as a curiosity on a dwindling few main line hauls.

For those who prefer to remember, and for the curious of the future, these notes on the steam-powered railroads which hauled logs for a living were gathered in the hope that it wasn't too late. The story is restricted to the 11 Western states, where a combination of awesome terrain and forests of magnificent proportions challenged the railroad logger, and where his ingenious, heroic and sometimes comic methods of overcoming Nature are most worthy of record.

TACOMA, WASHINGTON

KRAMER A. ADAMS

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WHISTLE IN THE WOODS

The trees were so tall that it took Paul Bunyan two days to see to the tops. He looked as far as he could in one day and started from that point the next morning.

Even the loggers' legendary patron had never faced such a challenge: to conquer the trees of the West and put them to Man's use.

Nowhere on earth did the softwoods grow so high, so big or so close together. And nowhere else did a whimsical Nature combine such tempting treasure with such formidable obstacles.

The loggers who drifted in from the East during the Nineteenth Century were astonished at the size of the trees before them. The land they grew on presented awesome logging problems and prospective markets for the produce were remote. To remove the green gold of the West would require new measures and new equipment.

It was a task for which the logger had been in training for nearly a century. He had developed the basic techniques among the hardwoods of the Northeast. The challenges of the Southern pines had been met and conquered. The skills of transforming trees to useful products were being tempered in the Lake States with devastating efficiency.

Paul Bunyan took the giant stride across the prairies and hesitated. The timber was there, but how to secure it?

Since the West's first lumber mills budded in the 1830's and 1840's, the handiest trees had been directed to the saws by either gravity or water. Technological achievement was symbolized by the use of horses and oxen to drag the logs, or an occasional chute which guided careening logs down the hillsides to the mill. Rivers, lakes and bays were the easiest means of transporting logs, but shoreline tree supplies wouldn't last forever.

The exact point at which a steam locomotive was first applied to the chore of hauling logs

has become obscured by time. George L. Colwell of Steuben City, New York, claimed that it was he who had first done so, in the 1850's. At any rate, it was an inspired formula that dictated the history of lumbering in the century that followed.

The rails were slow in reaching the Western forests. Where 71 logging railroads flowered in Michigan alone shortly after the end of the Civil War, not one was to be found in all the Western states and territories.

The delay was economic. The large capital investment of a railroad was practical only on large logging operations. Large operations had to be backed up by large mills and large markets. Neither existed in the sparsely settled West until the transcontinental railroads arrived. They opened the swinging door which brought in new settlers and permitted local produce to reach the East.

As early as 1852, operators of tidewater mills along the California coast had been using primitive railroads to bring logs short distances to the mill. Some of the cars on these wooden-tracked tramways rolled by gravity, while others employed horses or oxen. *Humboldt Times* in 1854 reported more than 20 miles of such lines around Eureka.

Significantly, the first steam logging railroad in the West was created to serve the needs of a transcontinental mainline railroad. The year was 1868, and railroad fever was on the land. Union Pacific Railroad was rushing its construction westward to join with Central Pacific crews working toward the east. One of the links in the nation's first transcontinental rail system was Denver Pacific Railroad, a subsidiary of UP.

The pressured Denver Pacific couldn't obtain ties and timbers fast enough for its difficult construction work through the Rockies. Perhaps it was a harried official of DP who suggested to local loggers that they adapt a railroad to the

task. At any rate, *Daily Colorado Tribune* early in 1868 reported that Arapahoe, Jefferson & South Park Railway Co. had just been incorporated and its owners were debating whether to use horses or a locomotive for power. Steam won out, and the line was soon hauling timber from Bergen's Ranch to Denver.

The short-lived operation proved a financial failure, but it had brought the revolution closer to the storehouses of Western timber.

Three years passed before the idea of combining steam and rails jumped the Rockies and reached the Pacific Coast. In 1871, *West Coast Signal* announced that Smith & Dougherty had closed down their mill to build a railroad into the redwoods near California's Trinidad Head.

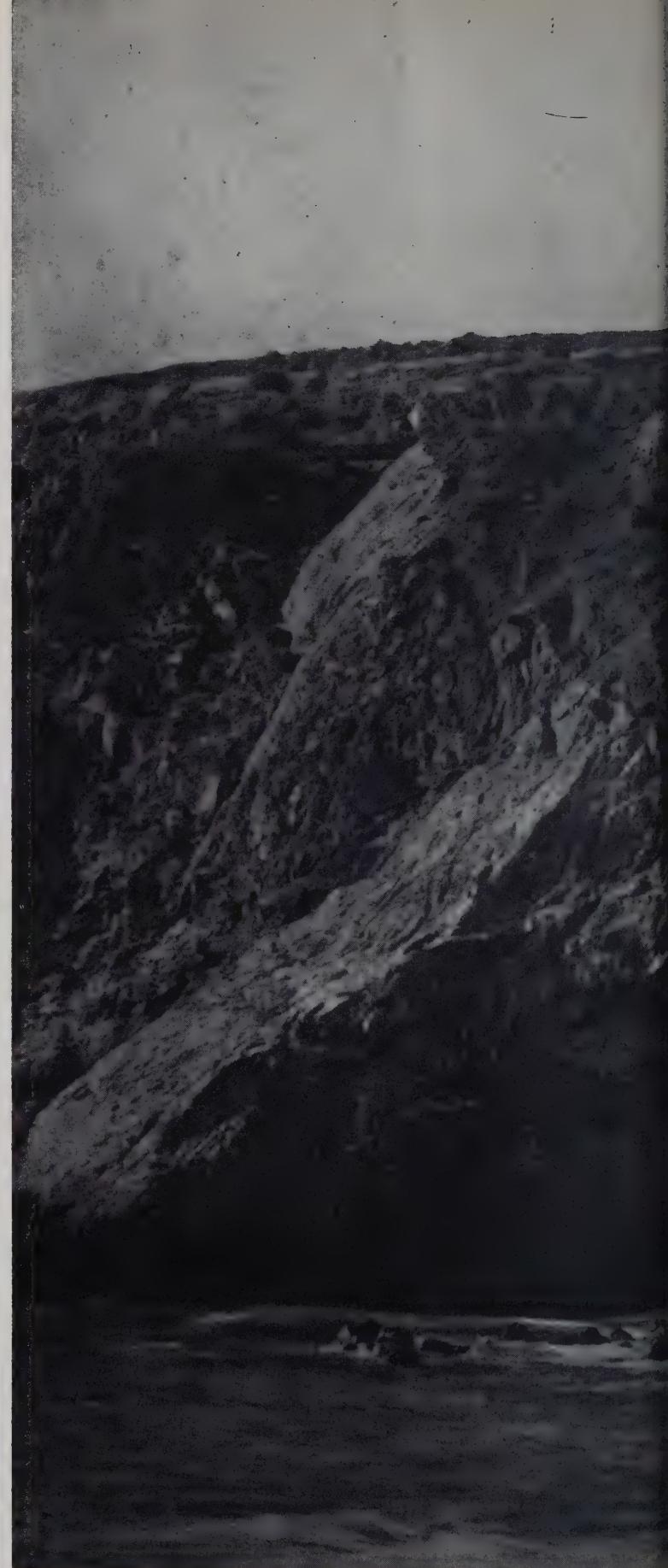
The advantages offered by steam power were soon being explored by other loggers on the Coast. Gualala Mill Co. was operating a wood-burning locomotive in 1872. John Vance's Humboldt Bay & Mad River Railroad chugged into the picture in 1874, besting by a year the nearby South Bay Railroad and Noah Falk's line.

At the beginning, the pioneer logging lines were merely substitutes for water. The concept of railroad logging hadn't yet moved out of the streambeds, and the wooden rails and end-to-end poles crept hesitantly along the path of least resistance. They were expedients to relieve the logger from his reliance on the vagaries of water transport.

By 1880, nearly two dozen lines were clawing into the timber of the coastal states. In 1883, California's Humboldt County alone could account for five separate logging roads, with two more a-building.

The earliest logging railroads were usually run by the operators of lumber mills who needed a dependable supply of logs. Later, a distinct

REDWOOD LOG on a pair of detached trucks weighed 30 tons and contained enough wood to build a house. Scene at Scotia in the '90's on The Pacific Lumber Co. line.





CLIFF-HANGER TRESTLE above the Pacific was used by L. E. White Lumber Co. at Greenwood in the '90's. Locomotive Number 1, a narrow-gauge 4-4-0, was built by Baldwin for North Pacific Coast Railroad in 1874.

separation of the logging and milling businesses took place, with the logging operator frequently supplying the millman under contract. In many cases, the logging company was a subsidiary of the lumber company. Throughout the rail logging era, about half the lines remained under the ownership or control of lumber manufacturing companies.

The advent of the logging railroad was opportune. Things were looking up in the 1880's. In a decade comparatively free of financial panics, the West was in for its first substantial boom since the Gold Rush.

Like a good fairy's magic wand, the mainline rails touched the land and brought it to life. Montana had its first railroad in 1880. A year later the rails pierced Southern California. The direct route from California to New Orleans and from the Great Lakes to Washington Territory opened in 1883. Oregon and Chicago were joined in 1884. Seattle and San Diego became terminals of the coastal rail link in 1887.

The coming of the overland rails vitalized the Western lumber industry. The thousands of settlers who poured in needed lumber for housing. So did the businessmen and agriculturists who served them. Aside from the booming local demand, the lumber companies found

that their export trade was no longer limited to the small holds of the coastal sailing schooners. The lumber market place was now 3,000 miles wide and Texas deep.

Out in the woods, the stepped-up demand for timber brought gradual improvements in logging techniques.

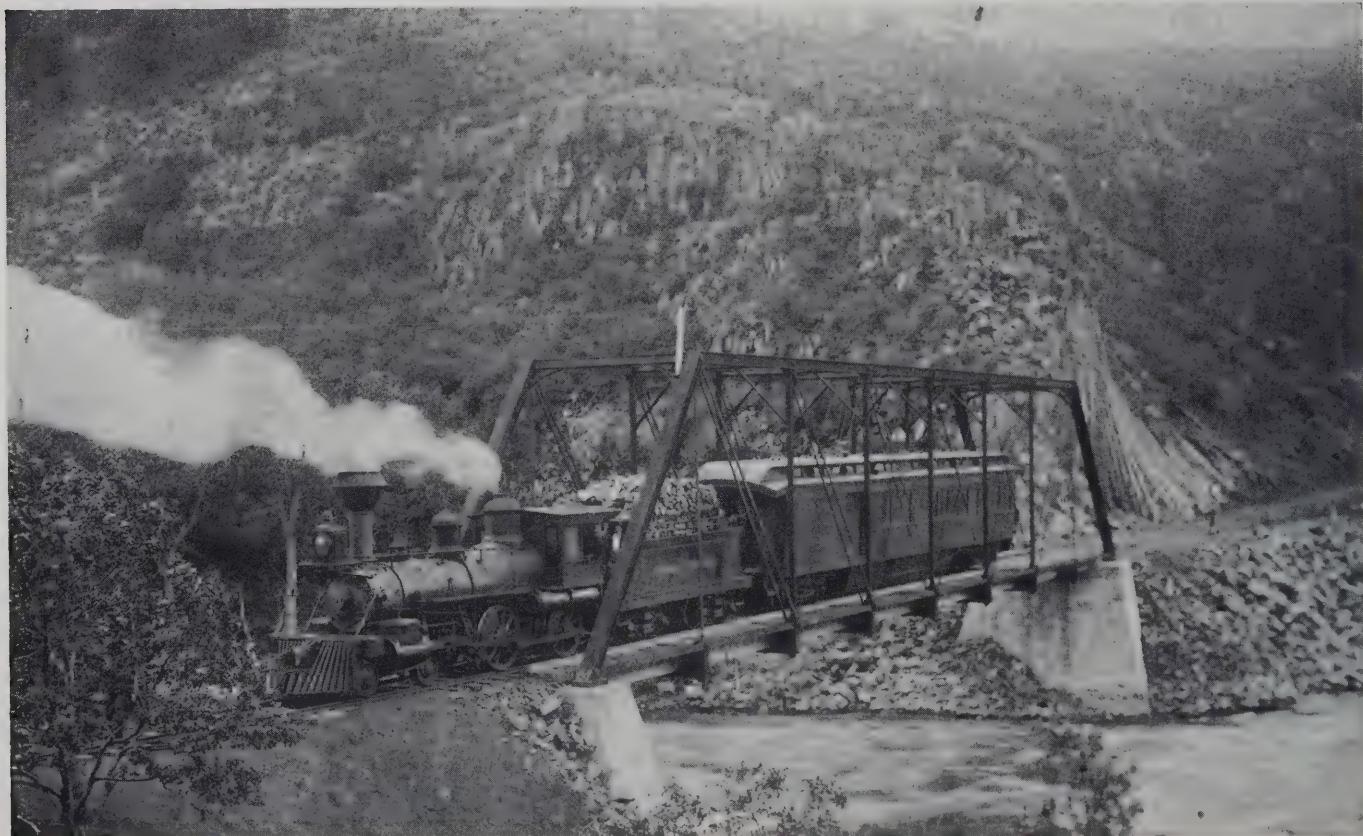
One of the earliest problems faced by the logger was that of loading the logs on railroad cars. Some of these tree sections came to the railhead weighing more than the locomotive and were sometimes wider.

With only oxen, horses or a puny little locomotive at his disposal, the logger fell back once again on Nature. He built his railroad tracks below the point where the skid road ended, letting gravity roll the logs onto cars.

The skid road was the pathway down which logs were dragged from the felling site by animals. Its lower terminal was known as the landing. It was common in the last century to implant a series of logs cross-wise to the incoming logs to ease the move to the cars. This type of landing was called a rollway.

With the advent of the steam donkey engine in the 1880's, the chore of handling logs became considerably easier. The donkey—so named because it was purportedly unworthy of being

PASSENGERS on Weyerhaeuser's Oregon Southern Railroad were more often found in the cab chatting with the engineer than in their coach. American-type locomotive is a Rhode Island product photographed at the Klamath River bridge in 1907.





COMBINATION TURN of trails and cars used by Bridal Veil Lumbering Co. in the '90's.

(Ore. Historical Society)

rated in horsepower — was patented by John Dolbeer of Eureka in 1882. A man who later became president of Caspar Lumber Co. steadfastly claimed that it was he—not Dolbeer—who invented the donkey. But the patent was proof enough to the logging fraternity and the portable engine became known as the Dolbeer donkey.

The donkey engine was first used in unloading logs at the mill pond. Soon it was out in the woods pulling logs to the landings. A later development was the "roader" donkey, which took over the skid road duties of animals and gravity.

A year after his development of the donkey, Dolbeer attached the versatile piece of machinery to the pilot of a locomotive. The combination of log-handling machinery and locomotive was dubbed a "gypsy." Now the locomotive's steam boiler could be applied to yarding logs from the tree stump to the rails.

The gypsy-rigged locomotive found limited favor almost exclusively in the Redwood region, although the last example of Dolbeer's invention was used in the pine forests of Oregon in World War II.

On some operations, the locomotive was em-

ployed in the log-loading process. Using a block and tackle arrangement, wire rope was passed under the logs and attached to the pilot of the locomotive. When the cable was pulled, the logs were par-buckled onto the cars.

At the other end of the railroad line, the problem of unloading the log cars was considerably simpler. Usually the logs would cascade into the mill pond of their own weight after the holding stakes, blocks or chains were removed. A canted track helped the process. Sometimes hand-operated jacks were employed to inch the logs off the cars toward the water.

Many loggers decided to dispense with the bothersome refinements of loading and unloading and merely trailed the logs between the rails behind the locomotive. Skid grease, planking and notched ties were sometimes used to ease the journey of the trailed logs, which were usually snubbed at the leading end.

Gradually the donkey engine became more powerful. Primitive gin poles were replaced by powered booms and spar trees. Progressively larger steam engines on log skids or rail cars took over the skidding, yarding and loading of

logs. By 1906, the production of logging engines was the largest branch of machinery manufacturing on the West Coast.

For the two decades of railroad logging that took place before the coming of effective geared locomotives, the logging operator struggled with underpowered industrial locomotives, high wheeled castoffs from mainline passenger service or home-made monstrosities. Except under the ideal conditions of a few candy shows, the limitation of available locomotive power wouldn't permit much flexibility at the woods end of the line. The logging railroad remained the equivalent of a mechanical river which hauled instead of floated logs to the mill.

It took many years for the classic pattern of railroad logging to evolve. As locomotives developed more tractive power and improved woods machinery freed the railroad lines from the limitations of fixed landings, the trains moved out to where the trees were being felled. Gradually the sound of the locomotive steam whistle penetrated the deep woods.

The logging railroad system which evolved might best be likened to the trees which brought

it into being. It was a collection of branches which fed by gravity into a main stem or trunk.

In logging, the branches were called spurs and the trunk the main line.

Spurs were considered temporary. As soon as the surrounding timber was cut, the spur would be abandoned or picked up and moved elsewhere.

The main line was the permanent part of the operation; the trunk of the system. It was the prime course of the logs moving between woods and mill.

By the mid-'80's, all the elements for efficient removal of the West's timber treasure had been assembled. The mainline railroads had created new markets for lumber locally as well as across the country; the donkey engine was available for handling logs in the woods; and the manufacturers of locomotives had recognized the Western logger's needs by providing more suitable power.

The stage was set for the greatest harvest of timber the world has ever known. The highball days were beginning.

BOOMING GROUND on salt water was the usual destination of the West's earliest logging railroads. Mills were located at tidewater to service the cargo lumber trade. This trestle at Tarheel, near Coos Bay, was used by Simpson Lumber Co. (Jack's Photo Shop, Coos Bay)





REDWOOD LOGS WORTH a small fortune even in 1891 are hauled to the Eureka mill by Number 3 Baldwin of Excelsior Redwood Co. The first log behind the locomotive had a diameter of 11 feet, 9 inches.



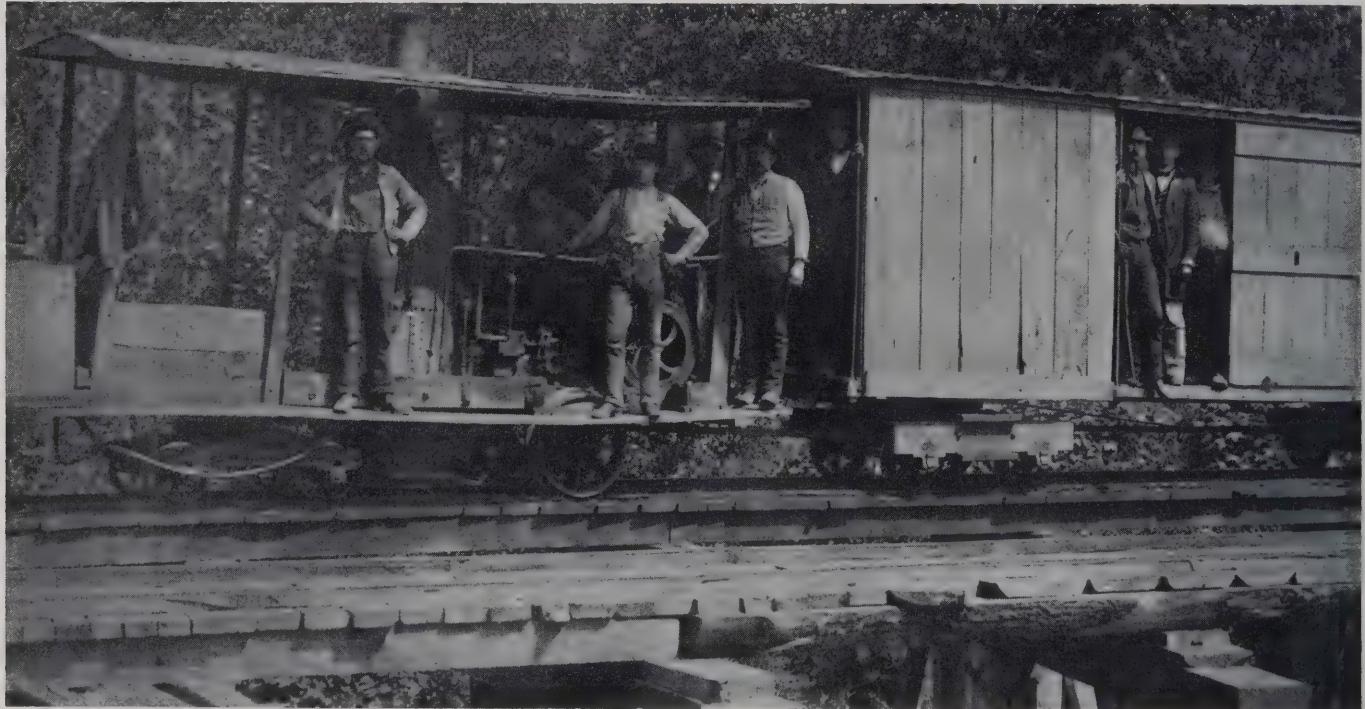
POLE ROAD CARS, powered by animals or gravity, represented the latest in woods technology in the mid-1800's. Tom Dollard, left, mans a jackscrew to dump a log at the Mendocino County camp of Jim Nichols in 1875.

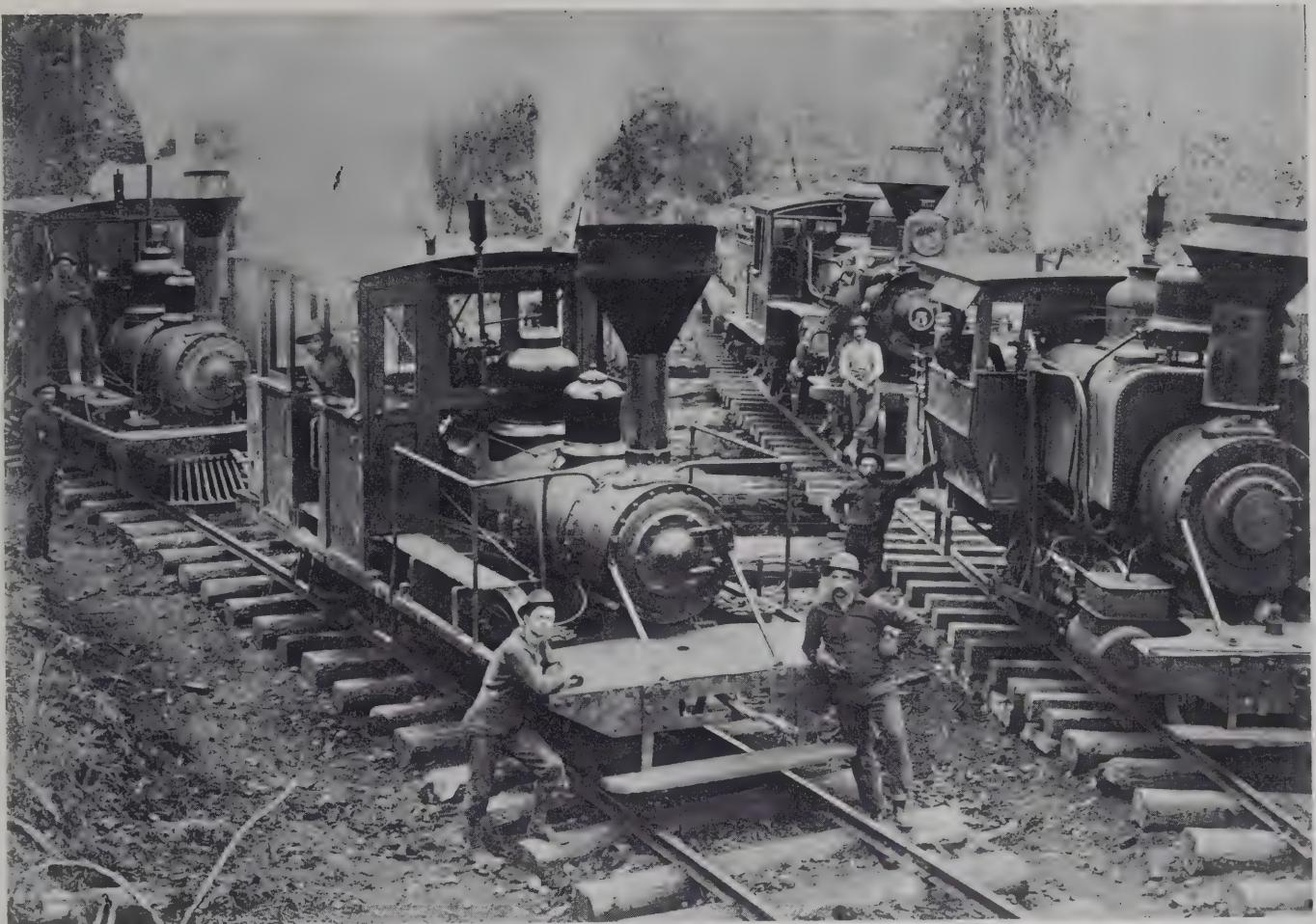


TWO-HORSEPOWER RAILROAD was typical of dozens which flourished along the Pacific Coast in the mid-Nineteenth Century. With the rising demand for logs, steam-powered locomotives began to supplant horses, mules and oxen in the Seventies.

EARLIEST STEAM LOCOMOTIVES in the Western woods were often home-made flatcar conversions with an upright boiler. Photo shows first engine of Oregon's Isthmus Railway, built in the mid-Seventies to haul logs, coal, freight and passengers.

(Jack's Photo Shop, Coos Bay)





NEWLY ACQUIRED CLIMAX locomotive was reason enough to roll out all the power of Yeon & Pelton Co. for the photographer. When this photo was taken in 1903, the line's rails were spaced 42 inches apart, a distance universally referred to as "bastard gauge." (Ore. Historical Society)

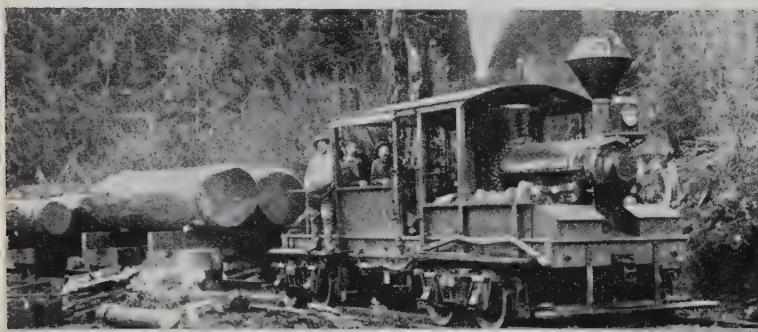
DONKEY ENGINE on wheels best describes this homemade logging locomotive of the 1880's.





LOCOMOTIVE ROSTER of Sierra Nevada Wood & Lumber Co. in 1898 included a pair of 1875 model Baldwins destined for greater things. Number 5, in center, was acquired by Warner Bros. Pictures and has been seen in numerous movies and television productions. Number 3, second from right, appeared in the movie "Union Pacific," among others, and is to be exhibited in the San Francisco Bay Area by the Railway & Locomotive Historical Society. (Calif. Historical Society)

WOODEN RAILS were tried by C. C. Masten with his brand new 1898 model Climax locomotive. In spite of slip-proof corrugations built into the flanged wheels, the wooden rails proved troublesome and were soon replaced with iron.



THE UNCOMMON CARRIERS

It was an age of rugged individualism, and in the public mind, the timber baron ranked only a notch below the railroad baron as a symbol of the times. All other barons of commerce, whether of oil, shipping, agriculture, banking, mining or cattle, were comparatively free of the muckraker's wrath because their activities were less exposed to the casual observer.

Portraying the rugged individualist was a role the logging operator enjoyed. More importantly, it was essential to his survival in the rough-and-tumble days of Western lumbering.

"The calling of the logger produces big men, robust, daring and bold," was the way Timberman George S. Long put it when addressing a pioneer session of the Pacific Logging Congress.

Had not the diplomatic Mr. Long been facing a group of loggers, he might well have included in his description such adjectives as "independent," "impatient" and "stubborn."

All such qualities were environmental products of the times which became nowhere more evident than in the logger's railroads. The tracks were the backbone of his operations, and there'd be no funny business tolerated at either end of the line or in between.

This attitude brought the logger into occasional conflict with the government, the public and other timbermen. But over the decades, he was more often engaged in battle with the nearest mainline railroad company.

The logger was obliged to do some kind of business with the likes of Santa Fe, Union Pacific and Great Northern, and the dealings were not always friendly. Some operators had to rely on the mainlines for all or part of their rail haul to the mill. Others rented log cars, locomotives or rail from the big companies. Machinery and supplies needed in the logging business were usually routed over public service tracks. And a large number of operators dealt with the transcontinentals in shipping lumber.

From the beginnings of the Western lumber industry, there had been a running battle between timbermen and railroad men over freight rates, demurrage, in-transit selling, rights of way and car shortages. It was to have a strong influence on the history of logging railroads.

Some of the timbermen reacted to the shabby treatment, real or imagined, that they received at the hands of the big companies by building their own common carrier railroads.

Among the dissidents were the Schafer brothers, who didn't like the rates charged by Northern Pacific for hauling logs to their Aberdeen mill. They set out to build their own line, but were refused permission to build a grade crossing over N.P.'s tracks. Quietly, the loggers mortgaged their business for \$10,000 and built a portable sawmill at Brady. It was soon turning out a large volume of timbers and planks. As none of the output was being shipped over N.P., an uneasy curiosity developed among the railroad officials. The suspense ended several months later when a large, ugly structure began to take form high over the N.P. tracks. It was a long overpass, built from lumber produced by the portable mill. Over it, Schafer Bros. log trains were soon shuttling to Aberdeen on tracks parallel to N.P.'s.

A similar reaction occurred when mainline railroads refused to build a line to serve the new Idaho mill of Potlatch Lumber Co. The enterprising lumbermen took matters into their own hands and built a 50-mile long independent railroad that thrives today as the Washington, Idaho & Montana.

Great Northern and Union Pacific told Long Bell Lumber Co. that their log trains were not welcome on the mainline tracks because a spill might block the tunnels. Long Bell's rebuttal was to build the six-million-dollar Longview, Portland and Northern Railway, which today operates three divisions in two states.



ARCATA & MAD RIVER Railroad's Number 2 led a double life. After hauling redwood logs to the mill, the immaculate little wood-burner was put to work on the passenger run. Engineer and conductor wear uniform hats in this scene of the late '80's. (Calif. Historical Society)

The tables were turned in the case of the log-hauling road of Elk River Lumber Co.. Its rails had been on the ground since 1884 and established priority over a mainline company that wanted permission to cross. There were some heated conferences, followed by grudging permission to the mainliner to make a grade crossing. But the loggers had driven a hard bargain. Aside from financial considerations, they insisted that every mainline train come to a complete stop and salute the logging road crossing with a blast of its whistle.

While revenge against the mainlines was a tempting reason for some loggers to enter the railroad business, it was overshadowed by other advantages. There was much to gain by converting a logging railroad to a public service corporation—or at least representing it as such. The reward could be in the form of profits, power or prestige. In some cases, the very existence of the logging road depended on its legal status as a common carrier.

To the railroad logger, the most useful bonus was the authority to condemn rights of way.

As an avowed public carrier, he had as much right as any railroad to secure land for his roadstead.

More than a few Western logging roads suddenly decided to become public service corporations when their planned courses ran into uncooperative landowners. If the logger didn't own all the land through which his tracks were to be laid, he had to make arrangements with other owners. If the landowner didn't want to sell, or his price was too high, the matter could be adjudicated in the courts only if the railroad in question was a common carrier.

This brought up the matter of "proper compensation," which often proved burdensome for the logger. In one case which went to court in 1909, witnesses valued the property in question all the way from \$15,000 to \$1,000,000. The court, by a reasoning which was never revealed, came up with a strange compromise award of \$99,000.

Most of the time, landowners recognized the benefits that would come with a nearby railroad—common carrier or not—and accepted the logger's right-of-way offer. Such payments averaged \$10,000 a mile for a number of years, although a few landowners were pleased to donate their land for right of way purposes.

One of the friendlier arrangements was negotiated by Simon Benson, a pioneer railroad logger on the Columbia River. For permission to allow the log trains to pass over his property, one cooperative homesteader settled for a fee of \$25 a year. As cash was scarce around Cathlamet in the 1890's, Benson made the annual payment in cordwood, as agreed.

At nearby Oak Point, the Weists fared less well in their right of way dealings. A stubborn landowner had blocked their plans for a short, straight track down a creek to the Columbia. In desperation, they built a skid road to the top of the hill behind the disputed property and installed a machine hoist. One by one, logs were taken off the cars and dragged up the hill. At the top, they were placed on a chute which dropped them into the river.

The Lewis brothers, who operated a sawmill in California's Sardine Valley in 1897, anticipated trouble from the many landowners who would have to be solicited for easement. Their solution was a novel one for the times, but would today be labeled a smart public relations gesture.

One memorable Sunday, everyone with earshot of the locomotive's whistle was invited to

the Lewis' picnic. There were the customary games, food and drink. Then came the clincher. The mountain dwellers were treated to a free ride on railroad flatcars. The neighborly overture paid off and road construction proceeded without a hitch.

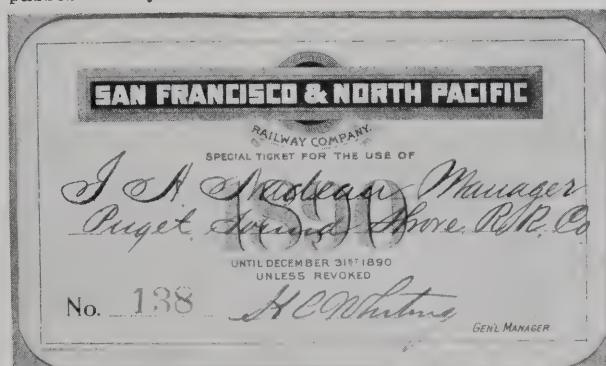
One landowner on Rocky Mountain Railway's right of way never was convinced that cattle guards were better than fences. As a result, every train that passed through the Switzer Ranch for 14 years was required to stop twice while the conductor opened and closed the gates.

On occasion the common carrier was used by the logger to hold economic sway over large areas of timberland. By establishing a public carrier, and operator could sometimes keep out competitive logging lines, which were denied the right of eminent domain. With a local monopoly on the transport of mill-bound logs, the shrewd operator was in a position to make favorable deals with nearby landowners.

Leudinghaus Brothers discovered this too late. Both they and Meskill Lumber Co. had their eyes on a strategic canyon pass in the mountainous terrain of western Washington. The land was owned by Leudinghaus, but Meskill quietly formed a common carrier railroad company and started condemnation proceedings.



COURTESY PASSES WERE freely exchanged among common carrier railroads. Operators of some small logging lines received reciprocal privileges from practically all the railroads in the country simply by mailing out a flood of passes each year.



Leudinghaus appealed in the courts, claiming that the canyon was too narrow for two railroads and that the access was vital to Leudinghaus operations. It was, but Lewis County Superior Court had no choice but to give Messkill & Columbia River Railway Co. a 60-foot right of way over Leudinghaus land. The decision had much to do with the merger of the two firms a few years later.

One unusual reason for converting a logging road to a common carrier was never publicly admitted by a Weyerhaeuser-affiliated line in Idaho. Under a 1903 law, saloons were prohibited within five miles of any "public works." It was charged that, by declaring as a public service corporation, the straight-laced management had a five-mile head start in keeping its thirsty employees sober.

For four or five decades, there was much confusion surrounding the status of logging roads as common carriers. Across the country, hundreds of suits tested the various laws and regulations of state and federal agencies.

The logger's problem was typified in the State of Washington, where an early Territorial law permitted railroads to condemn a right of way strip 60 feet wide and up to 200 feet where required. The Right of Way Act of 1899 cleared up earlier doubts by granting eminent domain privileges specifically to logging companies. But in 1904, the state supreme court ruled against Black Hills & Northwestern Railway, and threw out the Act of 1899. The Legislature in 1905 came up with the Toll Logging Roads Act, which straightened out the matter to the general satisfaction of loggers. A 1911 court decision in the case of Port Crescent Timber Transportation Co. clouded the issue once again, and law suits of various types began to appear on the dockets.

The logger's problem under the confusing welter of decisions and counter-decisions was touchingly reflected in a poem published by *West Coast Lumberman*:

But when he lieth down at last
And Gabriel blows his long, long blast
May he arise from the cold clay
And find to Heaven a right of way.

The questions to be decided by the courts usually amounted to a few thorny basics: did a logging road have to serve the public in order to gain the power of condemnation; was the railroad owned by a lumber or logging company entitled to the freight rate-sharing advantages of a common carrier; did the lower tax rates

granted to a quasi-public service corporation apply to the logger's common carriers; if the logging road received all the other advantages of a common carrier, did it have to comply with the regulations issued by the state railroad commissions and the Interstate Commerce Commission concerning such things as safety, wages and hours; and could a logging road be compelled to act as a common carrier when it controlled a vital right of way.

In some states, the era of railroad logging came and went without clear-cut official rulings for all the questions.

The famous tap lines decision of the U.S. Supreme Court in 1914 had a stabilizing influence on several of the basic issues. Overruling the Interstate Commerce Commission, it held that even if a railroad was owned by a logging or lumber company, it was entitled to the rights enjoyed by other railroad companies. The decision cleared up a number of suits then in the lower courts, most of which had been instigated by the big mainline railroads.

The large number of Western timber operators who dabbled in politics had a strong influence on laws favoring the small common carriers.

"Logger Joe Irving got himself elected to the Legislature," reported *The Timberman*, "and successfully pushed through the bill which broke the shackles of the right of way hog."

With or without laws, the chore of obtaining rights of way was often the most difficult part of building a railroad.

The alternative to a satisfactory right of way was what came to be called the "ram's horn route," a devious course which side-stepped the property of hold-out landowners.

An expensive demonstration of the lengths to which a determined logger would go occurred in Humboldt County in 1891. Occidental Mill Co. had a six-mile logging road which passed through the property of C. W. Hill. When Hill became involved in a dispute with the company concerning rights of way, he erected a spite fence across the railroad tracks. With no logs coming in over the rails, the mill was forced to shut down.

"This is a contingency the mill has not provided for," reported the contemporary issue of *Pacific Coast Wood and Iron*. Somewhat stronger terms were used to describe the situation by Occidental's Manager, J. J. Loggie.

After several weeks of impasse, Loggie took action. With a work force of 125 men, he started

out to build a one-mile detour around the disputed Hill property. It turned out to be one of the most difficult and expensive miles in railroad history.

Among other obstacles, he had to tunnel through a bluff, build a trestle, make deep cuts and construct a long fill that was 24 feet deep in places. In digging out the tunnel, dirt had to be hauled back up over the top of the hill in order to avoid trespassing on Hill's property. Timbers for the 350-foot tunnel had to be brought in by the same route.

Two months later, a triumphant Loggie was running five trains a day over the detour. Hill's spite fence was still up.

Loggers became familiar with one sure-fire method of settling a right of way disagreement. The railroad crew would lay its tracks over disputed property on a Sunday, when the land-owner could not obtain an injunction prohibiting the act. The terms then revolved around the undeniable existence of a railroad, often to the logger's advantage.

It was one of the tools of the early railroad builder, as were cajolery, trickery and force. A classic use of the latter took place in 1903, when the log-hauling Boca & Loyalton was extending its line. For three miles, its tracks ran parallel to the competing Sierra Valleys Railway. To reach a promising new lumber mill north of Beckwith, it would have to cross the SVR line. Understandably, B&L's request was turned down by the rival management.

Before the Sierra Valleys people could get

wind of what was up, B&L had hired an army of 100 men, issued guns, and hauled them to the crossing site. One version of the affair has it that a menacing group of Sierra Valleys partisans showed up, and were soon subdued by the abundance of free beer that the B&L had thoughtfully brought along for such an eventuality. At any rate, it was Sunday, and the SVR tracks were ripped out to make way for the B&L crossing frog.

In the cold, sober and legal light of Monday morning, however, a restraining order was issued by the U. S. Circuit Court. Boca & Loyalton had to replace the torn up track and seek another route to Beckwith.

Another mixup of memorable proportions involved Pacific Lumber Company's California & Northern Railroad versus Eureka & Klamath River Railroad, owned by Dolbeer & Carson and Vance Lumber Co. interests. Both lines held a franchise from the City of Eureka and both had purchased waterfront property there. But there was room for only one railroad track.

The rivals' race to run a line between the Klamath River and Humboldt Bay seemed won by C&N the night that its construction crew slipped into town and laid a track over the narrow bottleneck. The act forced an agreement between the two companies for joint use of the track, but the truce didn't last long. A year later, construction work of Eureka & Klamath River was held up by a C&N charge that the agreement had been broken.

PASSENGERS CAME LAST on the fabled Sumpter Valley Railway, as they did on all logging lines. This photo of the '90's shows Numbers 7 and 5 tackling the 5,000-foot summit with log cars ahead and passenger car trailing.

(Ore. Historical Society)



Countercharges were in the air when a new logger, Del Norte Humboldt Railroad was incorporated, and promptly filed a suit condemning the joint trackage of the other two lines.

The snarl was finally untangled in 1903 when H. E. Huntington, vice president of Southern Pacific, bought Eureka & Klamath River.

Up on the Olympic Peninsula, a man of vision named Norman R. Smith was certain that a railroad would have to be built north from Grays Harbor sooner or later, and its course would surely have to traverse a narrow pass near Lake Crescent.

With the zeal of the visionary, he loaded a pair of sawed-off rails on a pack horse and rode off deep into the wilderness. Choosing a strategic spot on the lake bank, he laid down some log ties and secured the short pair of rails.

Smith had established his right of way claim and now retired to await the fortune that would surely come with the railroad. Time passed and the line came, just as predicted. But it was a log-hauler whose whistles were never heard by Smith. He had died years earlier with only one compensation for his efforts: he had been the owner of the shortest railroad line in the world.

One of the Nation's shortest common carrier

railroads was The Pacific Lumber Company's Eureka & Freshwater Railway. Around 1910, it owned one locomotive and 95/100th of a mile of track.

Like some other logging roads, the E&F had agreements with cooperating companies to run trains over their tracks. There were other cases where the tracks of two or three individual railroad and lumber companies were used by one log-hauler incorporated as a common carrier.

By 1927, the logging railroad had become an established fixture on the Western landscape, and a Weyerhaeuser Timber Co. representative was able to tell that year's Pacific Logging Congress about one successful method of overcoming right of way difficulties.

The company was then opening up its Vail operation, and required an 87-mile railroad between the timber and Puget Sound.

"The most interesting part of the whole construction job was buying the right of way," Lloyd Crosby told the group. "Most logging railroads start right in the timber. Here, we had to cross 30 miles of improved farmland. In addition, we had to have a lot of terminal property on the bay."

"So we made our survey quietly, and after

GAY OCCASION IS OBSERVED in the mid-'80's on Humboldt & Mad River Railroad. Locomotive Number 3, "Onward," was an 1883 model Baldwin. (Calif. Historical Society)





PICNIC EXCURSION TRAIN was a common method of keeping loggers on the reservation for the Fourth of July. Operations might be crippled for days and weeks if woods crews reached town to observe Independence Day in their traditional outburst of patriotic fervor.

getting hold of the key pieces, we came out and told the people we were going to build a railroad. We told them we would be fair with them if they would be fair with us; that we wanted to pay what was right and wanted them to take what was right."

The straightforward approach paid off, Crosby testified, pointing to satisfactory arrangements made with no less than 108 different property owners.

Starting a log-hauling railroad wasn't the exclusive privilege of the logger. Businessmen in other fields saw the opportunities of providing a common service and successfully catered to lumber mills and logging operators along their lines.

In Oregon, some municipalities sought to capitalize on the potential benefits of running railroads into the woods and bringing the logs to the town's mills. The movement started in 1915 when citizens of Grants Pass became impatient after the 12 years of false starts that their local railroad, the Grants Pass & Eureka, had made toward its California destination. Their lobbyist at the Oregon State House helped

pass a law permitting municipalities to build, buy and operate railroads for profit.

Medford, Prineville and Klamath Falls were among the other towns which bonded themselves to enter the railroad business. But governmental railroads ran a difficult course. The only one to meet with clear financial success was the Municipal Railroad of Klamath Falls. Its 20-mile line out to Dairy was sold at a profit in 1919 to become part of the Oregon, California & Eastern.

The big mainline companies were annoyed by the fact that practically anybody could declare his railroad to be a common carrier. Sometimes the logging lines pre-empted the choicest or only feasible rights of way between two important points. Condemnation of one public service corporation by another was usually out of the question, and the logging line which was on the path to empire chosen by a mainline giant had to be bought out.

One such innocent was Willamette Pacific Railroad Co., which became a pawn in one of the last major battles of the Western railroad moguls. It had been incorporated in 1911 by

Wendling-Johnson Lumber Co. for the prosaic purpose of hauling logs.

Across the Siuslaw River, British capital was behind the construction of Pacific Great Western Railway, designed to link Coos Bay with the Willamette Valley. Southern Pacific saw this as a threat to its own ambitions to tap the unexploited Coos Bay markets.

S.P. acquired Willamette Pacific, and began a war of nerves with the rival line across the river. Press releases and rumors were the major weapons. The power play ended when S.P. bought out Pacific Great Western at a considerably inflated price, and built peacefully on into Coos Bay in 1916.

The climax of nearly a century of railroad wars took place in Oregon in 1914. The cause was a pair of large lumber mills which were under construction in the isolated community of Bend. Two Western railroad giants of the day, J. J. Hill and E. H. Harriman, headed their rival lines south from the Columbia River. Before an agreement was reached, the struggle for a right of way up the narrow canyon of the Deschutes River had reached comic opera proportions. Armed conflict took place between the rival crews, sabotage was done and hundreds of thousands of dollars was poured into wasteful parallel construction. It would take decades of revenues to indemnify the costly war.

Another Hill venture, Pacific Eastern Railroad, was designed to be a link in the magnate's plans to reach San Francisco. When it became obvious in 1920 that the dream was a costly folly, the two million-dollar line was sold to a lumber company for \$270,000. It serves today as a log-hauler for Medford Corporation.

In 1905, four California logging lines found themselves engaged in an unusual competition. The prize was a bonus of \$100,000, offered by the citizens of Klamath Falls to the first railroad to reach their doorstep.

Klamath Lake Railroad, owned by Weyerhaeuser Timber Co., had the advantage on the northern end of the course, but faced a costly construction job to tie up with Southern Pacific 30 miles to the south.

California & Northeastern Railroad, owned by Weed Lumber Co., put 250 men to work grading a 75 mile extension which had a comparatively easy grade into Klamath Falls.

McCloud Lumber Company's McCloud River Railroad pinned its hopes on a right of way that would take it 60 miles due north.

While the logging road of Diamond Match Co., out of Chico, had the greatest distance to go, it was the most likely contender. Diamond Match was owned partly by Financier Jay Gould. It was known that Gould had dreams of breaking into the transcontinental railroad game. Diamond's logging road might be the means.

But Northern California was the domain of the powerful Southern Pacific Railway, and the giant stirred at the threatened intrusion. As a counter, President Harriman formed Chico & Northern Railroad Co. as a subsidiary of S.P. Without delay, it bought Diamond's main line logging road and leased it back to the company.

Having sealed off the Gould threat, Harriman then sat back to watch the struggle between the three remaining lines. It was a safe pastime, for no matter which lumber company pocketed the \$100,000 bonus, its rails would have to connect with S.P.'s mainlines.

Finally, in 1906, Harriman tired of the slow action and announced that S.P. would build into Klamath Falls. The logging lines discarded any



mainline ambitions they may have had and concentrated anew on the business of hauling logs.

About the same time, two large railroads began their bidding for Bellingham Bay & British Columbia Railroad, which controlled a key stretch of track between Puget Sound and Canada. Great Northern Railway Co. was dominant in the area and made insistent offers to buy the road as a supplement to its Bellingham-Vancouver line. The owners, Bloedel-Donovan Lumber Mills, resisted, feeling that another railroad in the area would be good for both the lumber business and the community. They scorned GN's offer and sold BB&BC to a grateful Chicago, Milwaukee, St. Paul & Pacific Railroad.

Disaster came to one logging line that had expected to be taken over by a mainline giant. When Fred Herrick Lumber Co. received a contract to buy Forest Service stumpage in central Oregon, it contained a requirement that a railroad be built into the timber.

Herrick was a successful Idaho lumberman who believed in the principles of rugged individualism. Without subsidies of any kind, but with an unstated hope that Union Pacific would take over the line as soon as it was completed, Herrick boldly embarked on the project that had deterred lesser men.

DECORATIONS were frequently applied to logging locomotives. Engineer of the One-Spot at left obviously bagged his buck during the last deer hunting season. Christmas spirit of the headlight wreath at right doesn't seem to be shared by the Shay's crew. Flags, whiskey bottles and underclothing sometimes marked lighter occasions, while black crepe mourned the passing of the engineer.

Bids for construction of the proposed 90-mile Malheur Railroad were sought in 1924, but proved too high.

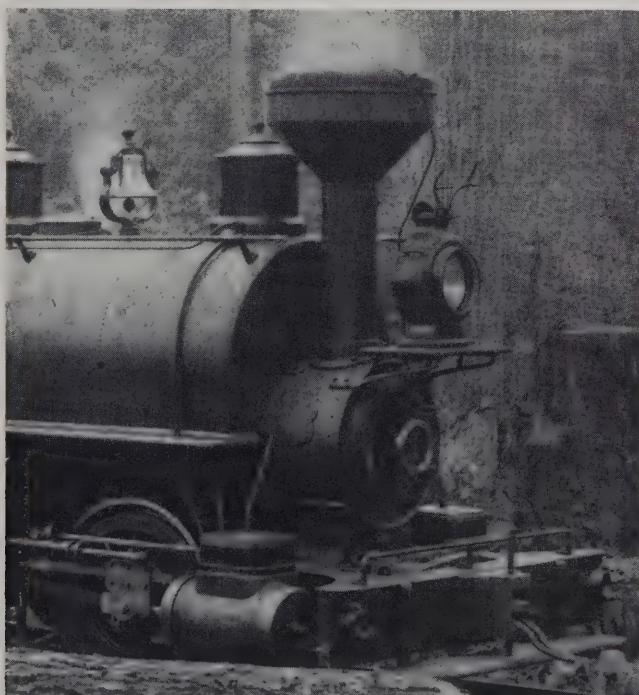
"So we decided to do the grading with local help," Herrick related. "We got out and taught some of the ranchers how to build a railroad. It cost us about \$1,375 a mile, exclusive of track."

In spite of ingenious shortcuts, Herrick had invested a million dollars of his own money in the road by 1927. The Forest Service contract had to be rewritten four times to allow Herrick to continue.

As expected, Union Pacific bought the 30-mile section which had been completed between Crane and Burns, but the remaining two-thirds of the line were still in Herrick's hands.

As the first to enter the town of Burns, Malheur Railroad became the object of the inevitable civic celebration. This time the optimistic speeches had a hollow ring. Herrick was broke. Both he and Chief Forester Greeley were being investigated by Congress on a charge of collusion in the government timber contract. And Union Pacific showed no interest in bailing Herrick out by buying the rest of the troubled railroad.

Along with Greeley, Herrick was cleared of the collusion charges, but the railroad venture had proved his undoing. Fred Herrick Lumber Co. was soon bankrupt. Edward Hines Lumber Co. took over, and operates part of the old Malheur Railroad today as Oregon & Northwestern.





SUNDAY OUTINGS provided an incidental source of revenue for Oregon & Southeastern Railroad. When log trains were not running, speeders were rented out to picnic-bound groups. No deposit was required on the rolling stock, which could go neither fast nor far.

At one time, nearly half the large logging operators declared their main line trackage to be in common carrier status. Among other incidental benefits, it meant that the little logging line could issue courtesy passes, just like any other common carrier, and swap them with officials of the big mainlines. The inequity of allowing a free ride on the entire Pennsylvania Railroad system, for example, in theoretical exchange for a two-mile ride in a leaky crummy on the Knothole Western, did not escape the big railroad company officials. But they were stuck with one of the evils of their own pass system, and besides, some of the jerkwater lines were owned by companies which shipped out lumber over the big roads.

A significant story is told about the general manager of a transcontinental railroad, who many years ago was checking the annual pass list. Opposite the name of a pretentious-sounding logging road whose president had sent in a courtesy pass, the general manager wrote: "Never heard of this one, but better issue them a black-mail ticket."

To the brass in the lumber and logging companies, the creation of a separate common carrier company sometimes meant the acquisition of such impressive new titles as director, president, vice president or manager of a railroad. *Poor's Manual* in 1887 listed a C. E. Camp of

Caspar & Hare Creek Railroad as vice president, superintendent, chief engineer and purchasing agent. If the railroad had an office, no doubt Mr. Camp would have been assigned as janitor, too, for the Caspar & Hare Creek line was only seven and-a-half miles long.

More of a hazard than a benefit in common carriers was the paying passenger business. Some logging lines had great hopes for making money at it, while others felt it necessary only to comply with regulations or the needs of local residents. Except for a few such lines as California Western, Yosemite Valley Railroad, Lake Tahoe Railway and Sumpter Valley Railway, the logging operators generally considered passengers other than employees to be a nuisance, and avoided any interference with their railroad's major mission of getting logs to the mill.

Any arm-waving pedestrian on the right of way would always be picked up by a log train anyway, though it sometimes meant riding to town at unpredictable settings somewhere between the pilot stand of the locomotive and the caboose.

A major enticement for loggers to join the list of common carriers was the right to share special freight rates with mainline companies. Equipment and supplies brought in for the logging operation received a transportation discount, as did logs or lumber going out.

The rake-off was a sore point with the main-

line railroad companies. Until the tap lines decision settled the matter, they harassed the small operators with scores of legal challenges. The logging railroader was generally upheld in his defense before courts and commissions, with the result that a Western logger didn't feel that he had made his mark in the world until he was running a common carrier.

Such a status could be improved considerably by the proper choice of a name. It was one of the bonuses that came with establishment of a common carrier. Nowhere does the Western logger's personality show up so vividly as on the list of his railroad names.

Some of the titles were outrageously presumptuous, as in the case of Colorado, Utah & Western, which never laid tracks more than six miles out of Fraser, Colorado. Great Southwestern aimed southwesterly sure enough, but only for five miles.

The grandly named Washington, Idaho and Montana Railway runs only three miles in Washington and not an inch in Montana. The California & Oregon Coast Railroad never made it to California nor anywhere near the Oregon Coast. Great Southern Railroad struggled as far south as Friend, Oregon, and expired.

"Pacific" was a favorite in Western railroad titles. But among the dozens of logging lines using the name, not more than a few ever got close enough to their namesake ocean to sight a saltwater seagull.

Minarets & Western ran neither westerly nor within a dozen miles of its namesake town of Minarets. Washington Western ran almost due north and south. The railroad of Mason County Logging Co. wandered around Thurston and Grays Harbor counties, but never managed to get into Mason County.

Most of the loggers' common carriers bore names descriptive of their actual course, rather

than impressive destinations they'd never reach. Even so, it was possible for the title to become a bit unwieldy. Such lines as the Olympia, Sherman Valley & Grays Harbor Railroad & Lumber Co.; Snohomish, Skykomish & Spokane Railway; and Coos Bay, Roseburg & Eastern Railroad & Navigation Co. inspired a loggers' joke that it took two box cars just to carry the railroad's initials.

Railroad shippers seeking a routing in Northwestern Oregon's Columbia, Clatsop and Tillamook counties could never be sure which line was which. At one time or another, logging operators in the area had named their common carriers the Columbia & Nehalem River Railroad; Columbia & Nehalem Valley Railroad; Columbia City & Nehalem Railroad; Columbia, Nehalem & Pacific Railway; Columbia River & Nehalem Railroad; Goble-Nehalem & Pacific Railway; Goble, Nehalem Valley Railway; Goble & Nehalem Railroad; and Clatskanie & Nehalem Railroad.

Indian names had a sometimes melodious influence on the logging lines of the West. There was Shoshone & Clearwater Railway, Navajo Southern, Zuni Mountain, Apache Railway, Kootenai Railroad, Hetch Hetchy & Yosemite Valley and Big Blackfoot Midland.

Writer Charles Nordhoff spoke for other Indian names when he wrote in *Harper's News Monthly Magazine* in 1874:

"When you enter Washington Territory, your ears begin to be assailed by the most barbarous names imaginable. On your way to Olympia by rail you cross a river called the Skookum - Chuck; your train stops at places named Newaukum, Tumwater, and Toutle. Seattle is sufficiently barbarous; Steilacoom is no better; and I suspect that the Northern Pacific terminus has been fixed at Tacoma because it is one of the few places on Puget Sound

PASSENGER TRAIN was a common sight in the woods. These coaches of Washington Pulp and Paper Co. had seen better days on the Great Northern before being used to haul wood crews between camp and the setting.



whose name does not inspire horror and disgust."

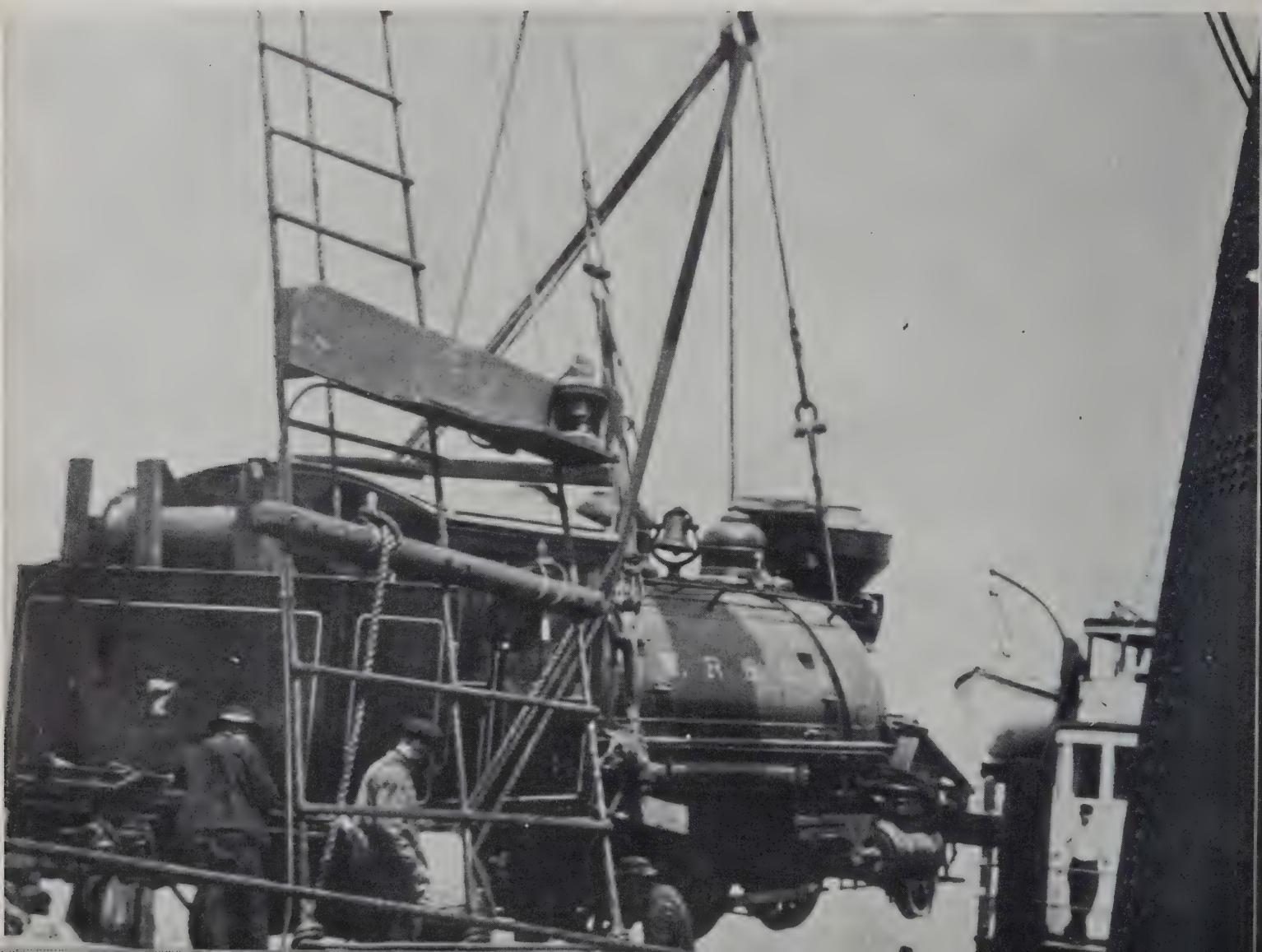
Nevertheless the Indian heritage persisted, adding to America's logging railroad history such winsome names as Little Skookum & Chehalis Railroad, Cowlitz, Chehalis & Cascade and Big Creek & Telocaset. And who can deny that the very sound of Klickitat Northern in itself echoes the rhythmic progress of a steam train?

Poetic euphony is found, too, in such lines as Noyo & Pudding Creek; the Glacier, Indian Valley and Sugar Pine railroads; Kaweah & Giant Forest; and Red River Railroad.

Some of the loggers indulged in the luxury of naming their railroads after themselves. Others displayed delightful whimsy by using such names as Ping Pong Railroad, Keno Railroad, Hoo Hoo Railroad, Skookum Railway and O. K. Railroad.

The history of railroad titles must reserve a special place for Irishman Henry McCleary, who scorned place names, Indians and pretentious destinations. His two battered old locomotives were painted with the proud green legend, "Shamrock & Western."

SEA-GOING LOCOMOTIVE of California Western is deposited on the wharf at Fort Bragg after a trip up the coast from San Francisco. Number 7, a 1909 model Baldwin, was one of many logging locomotives which operated on lines far removed from other railroads.





SHAY NUMBER 2 of Georgia-Pacific Corporation's Feather River Railway still serves on the scenic canyon run to Feather Falls.



MODEL T FORD powered this train on its common carrier run to town. Trailer car was added to the consist on weekends when traffic picked up.

(Darius Kinsey photo from the collection of Jesse Ebert)



LOG DUMP OF YEON & PELTON on the Columbia River near Rainier in the last century. Logs were unloaded from cars by means of hand-operated jacks. (Ore. Historical Society)



LOG LOADING in early days made use of either gravity or portable steam engine to roll logs onto cars. In this Redwood region scene, pole at right supports a wire rope line manipulated by the donkey engine at rear.

NARROW-GAUGE CLIMAX shoves a steam loader into position on the ridge-running line of LaMoine Lumber & Trading Co. Both railroad and saw mill were located on mountain tops, with lumber being flumed seven miles down the Sierras to Dunsmuir.



LOADING LOGS onto flatcars was another chore performed by locomotives. This wood-burning saddle-tanker is tugging a wire rope which, through a pulley arrangement called "parbuckling," will roll logs onto the cars. Scene at McDougal's camp in 1901.





McGIFFERT LOG LOADER used by Feather River Lumber Co. was a popular type of steam jammer found in the pine region from about 1915 to 1950. It pulled empty cars from the rear, loaded them and winched the loaded cars down the track.

SHOVEL LOADER of Greenlaw Lumber Co. employed a simple pick-up-and-drop method of getting logs onto cars. Horse-powered high wheels were widely used in the Western pine region into the '20's to bring turns of logs to the landing.

SPAR TREE LOADING RIG became popular after the inauguration of high lead logging about 1910. Rail-mounted electric donkey at right was able to yard and load logs through an elaborate series of cables and pulleys attached to the top of the spar tree. Photo shows mid-'20's operation of Sugar Pine Lumber Co.



BOOM LOADER of La Moine Lumber & Trading Co. employed a log-handling principle still used in the woods today. The rail-mounted loading engine, which could be moved from place to place, has been replaced by permanent reload points on the surviving railroads.

PORTABLE HIGH LEAD RIG of Modoc Lumber Co. in 1919 used an overhead loading method where possible. Rail-mounted donkey engine has skidded this turn of logs up the hill from where they were felled and will drop them on skeleton cars.



STEAM DONKEY ENGINE had come a long way by World War I. This skid-mounted log-handler of Snoqualmie Falls Lumber Co. could winch itself from place to place but was transported to distant settings by rail.



LIDGERWOOD SKIDDER and loader was the ultimate development in steam woods technology. This car-mounted monster was used by Weyerhaeuser Timber Co. to load logs with a heel boom, skid logs on ground leads, haul logs through the air by means of the portable spar and jockey cars into loading position — sometimes all at once.

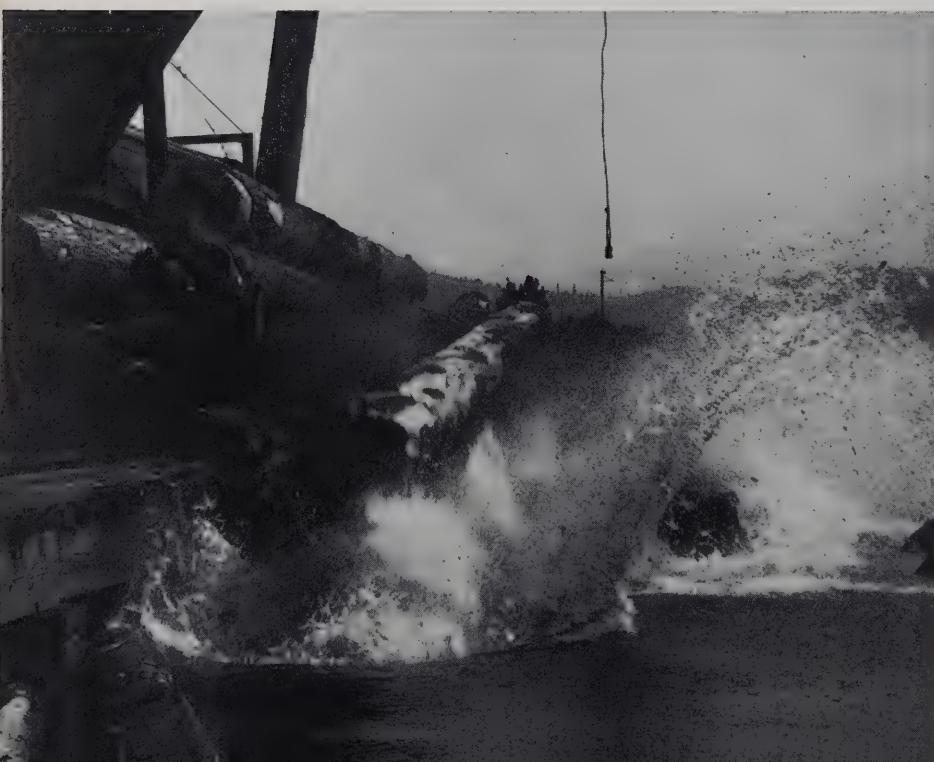


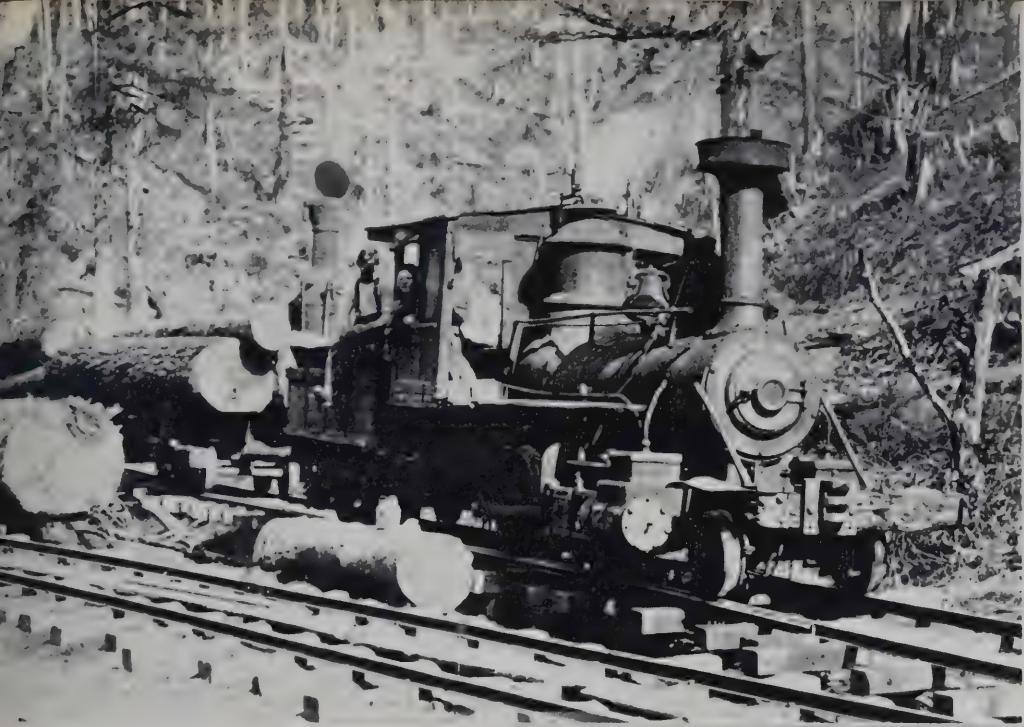
SLIDING JAMMER, A gasoline-powered loading rig, moved along the cars on its own temporary rails. As a car was loaded, the jammer was winched to the next car on wooden or steel rails laid across the car beds. Scene at the Elk River operations of Potlatch Lumber Co. in 1928.



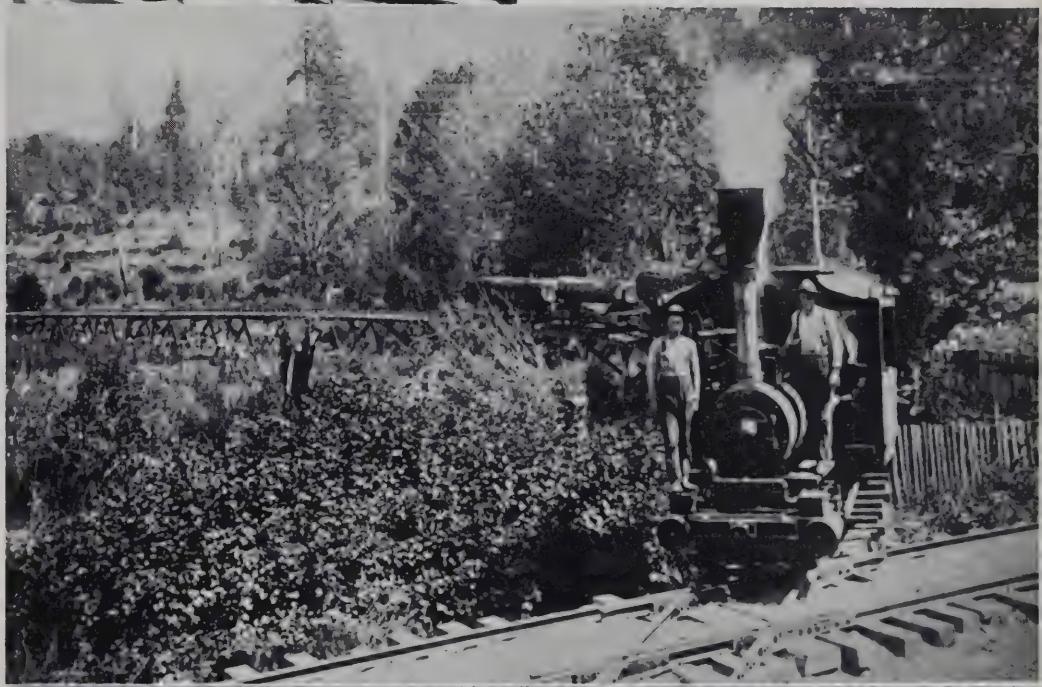


SHAKY TRESTLE ON THIS Northern California pine operation wouldn't handle both the locomotive and loaded cars. To get the flats into unloading position at the dump, they were uncoupled from the Shay and given a quick push onto the trestle. Remaining safely on firmer roadbed, the locomotive then hauled the cars back to the unloading boom by means of a cable.



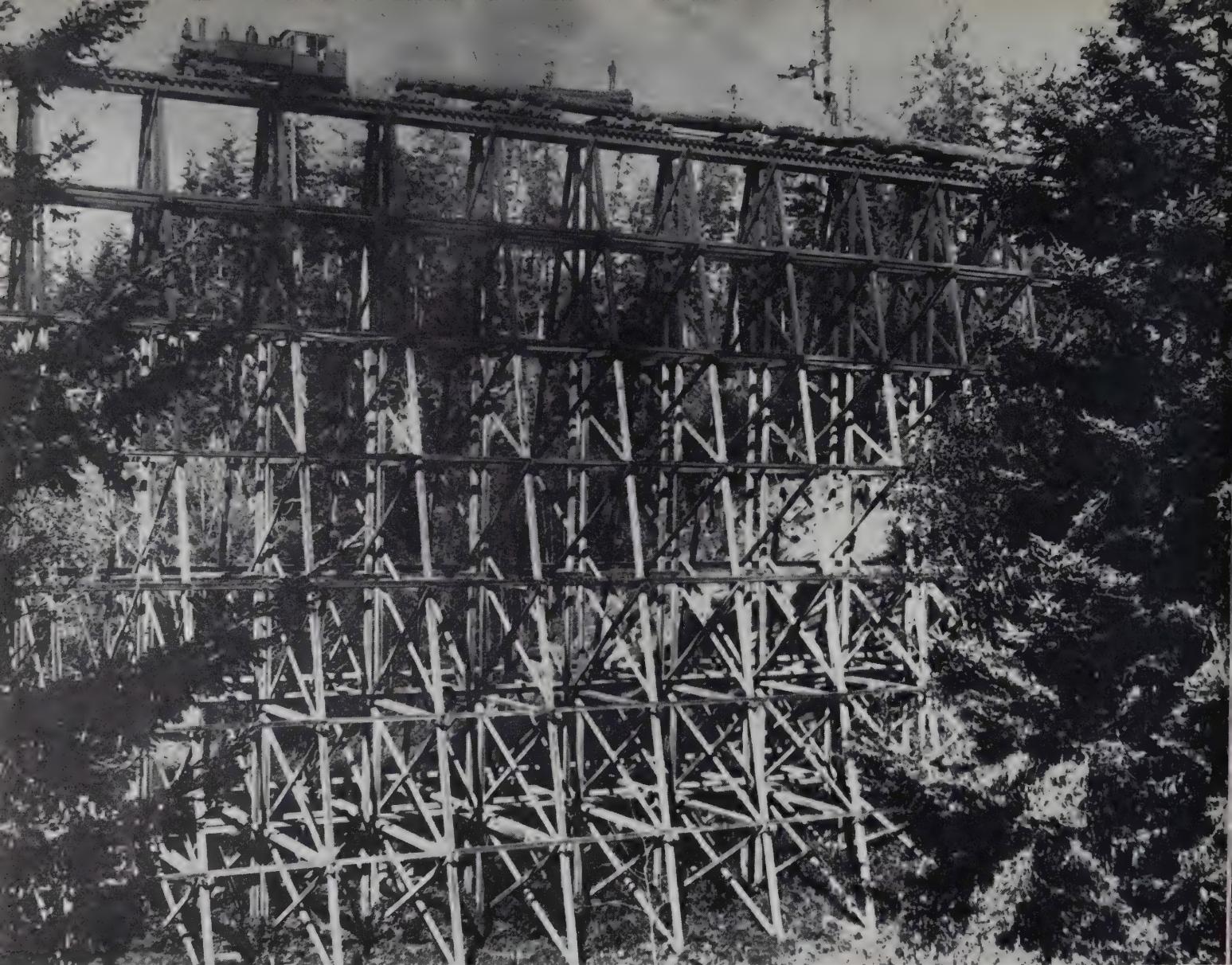


(Bottom) Hinckley & Co. 0-4-0 was built in 1872 for a coal company at Coos Bay and later used for logging at Blossom Gulch.



VARIETY of woods motive power is evidenced by these narrow-gauge engines which operated within a few miles of each other in Coos County at the turn of the century. (Top) National locomotive was once the pride of Prosper Mill Co. (Right) Wood-burning dinkey used on John Aasen's operations at Norway. (Left) Spunky little locomotive of Campbell & Swigert near West Fork. (Jack's Photo Shop, Coos Bay)





LOCOMOTIVE NUMBER 3 and Jughandle Creek trestle of Caspar, South Fork & Eastern Railway were both slated for disaster shortly after this photo was taken. The trestle, once the largest ever built of wood, was a pile of kindling after the California earthquake of 1906. "Smilax," the 35-ton Baldwin, was purchased new after its display at San Francisco's Mid-Winter Fair of 1894, and later dove off another trestle while hauling logs.



THE SCENERY INSPECTORS

"If we could flatten out these hills," loggers were fond of saying, "the forest would cover all of the U. S. and part of Texas, too."

Pushing steel into the hills became the most expensive, the most dangerous and the most frustrating part of the logging business.

The problems of laying out and constructing a railroad into the timber seldom gave the operator more than temporary concern. Had he been better educated in the physical sciences he might have had occasion to pause, consider and throw up his hands.

But the mills needed logs, and the logger aimed his right of way ingeniously around the mountains, up them, across them or through them. The word "aimed," rather than something like "platted," would have been preferred by the early logger, for the course of the railroad was usually ad lib. It was he who referred to the process of locating a railroad line as taking "a shot in the brush."

Of necessity, the laying out of a logging road was a supremely casual matter compared with the elaborate preparations of the big mainlines.

Where the subsidized or well-financed mainline road was built to last for decades, the logging spur might be used for only a matter of months before it was pulled up and moved elsewhere. Nor was passenger comfort and safety the concern of a logging line.

There was another major difference between log-haulers and the big common carriers. The logger's course might best be compared with an irrigation project. The object was not to find the best route through the countryside, but to cover the entire area with a system of lines.

Historically, the job of plotting the course of the rails fell to the woods boss. In the past he had sized up the terrain to decide where oxen and horses should skid the logs, and he now guessed that the rails should follow the creek bottoms.

Confronted by a mountain or a drop-off, it was a simple matter to pull up the steel and hunt for another creek.

The supply of new creeks was getting scarce, and much of the mountainside timber remained untouched, when the subject came up for dis-

cussion at an early session of the Pacific Logging Congress.

Survey the ground two years or more ahead of the operation, said a brash young man named J. J. Donovan. Your logging foreman cannot lay out these roads and construct them without expensive mistakes, the line of heresy continued. Keep your main line grades below three per cent, Donovan advised, and don't exceed ten per cent anywhere.

How to get the railroads out of the creek bottoms and into the timber on the hills was the problem of the day. The few Logging Congress members who recommended topographical surveys and maps were thought to have been kicked in the head by a Hodag.

"Possibly there's some value in this idea of topographical surveys," admitted one delegate, "provided you don't go too far and spend too much money. As far as I'm concerned, I'll stick with the trusty compass and a good eye. They're pretty handy instruments to have around and they don't cost much."

The only way to reach the timber in hard country, cracked one woodsman, is to log by balloon. Or cut off the tops of the trees so they're level, suggested another, and run the railroad over the stumps.

As the years passed and timber stands retreated from the mills, operators reluctantly recognized the need for employing the tools and talents of the construction engineer.

In the woods, he was called a logging engineer, or, more often, the "scenery inspector." He was barely tolerated when he first appeared just before World War I. His salary of \$100 a month or so was a luxury to the operator and a goad to the lesser-paid. And the woods boss still felt that he could lay out a railroad without the services of a college punk.

It wasn't an easy profession. The engineers indicated as much in a long poem they recited to each other (printable portions of which follow):

We lay out their railroads and work in the rain

*We walk to our jobs, we don't ride a train,
That job of the company's engineers—*

*The company's poor damned engineers,
Living the lives of trappers.*

While the logging engineer had other chores that made use of his training, his main responsibility on a railroad show was to locate routes to and from the timber. Such rights of way were to be the cheapest, fastest and safest—usually in that order of priority.

The scenery inspector brought order to the building of woods roads, leaving his mark in some remarkable engineering feats that complemented the native ingenuity of the logger.

Contrary to the practice in Eastern lumbering operations, the Western railroad was sometimes built from the timber outwards, following the path of least resistance down to the main line or log dump. This meant that construction supplies and equipment had to be taken out to the remote construction site by some means other than train.

This necessity brought some uneasy moments for Warren Spruce Co. during World War I, charged with hauling airplane spruce out of Oregon's precipitous coastal forest. The railroad would have to bridge a large number of canyons and draws, calling for immense quantities of piling, timbers and ties.

The pace of the Kaiser's air war didn't allow time to build a temporary pioneer road.

How to get the railroad construction materials to distant building sites was the problem

SKYLINE CARRIED PRE-FABRICATED units into place on this trestle built at Weyerhaeuser Timber Company's Vail logging operation.



of H. N. Ormsbee, Warren's logging engineer. His inspired solution helped the company earn a War Department citation for meritorious service.

Recalling the engineering tenet that if you can't beat Nature, join her, Ormsbee first put his construction crews to work building barges. These were loaded with the uncounted tons of timbers and planks needed to build the railroad. The barges were then towed across the bar at Newport and out into the Pacific Ocean. At points opposite the shore locations where materials were needed, the vital cargo was jettisoned on the high tide. Waves floated the wood ashore. On the beach, lines were attached to the salvaged jetsam and horses snaked the materials through the sand to waiting construction crews. "High-tide Ormsbee" completed his railroad on schedule.

Until the railroads came, water had been the best friend of those who sought to move logs from one place to another, and Lamb-Davis Lumber Co. beneficially combined the two. After years of floating logs down the Wenatchee River, a large number of strays had slipped away from rafts and beached themselves along the banks. The high-and-dry logs weren't worth salvaging individually, but collectively, they represented a sizeable investment.

A monumental retrieving system was rigged up. At the point where the Wenatchee enters the Columbia, a string of logs was anchored from shore to shore to make a boom. Many miles upstream, Leavenworth Dam was filled to capacity. When the dam's gates were suddenly opened the high flood waters neatly floated the scattered logs into the boom. Lamb-Davis engineers next built a railroad line to the boom, over which cars carried the salvaged logs 20 miles back upstream to the mill.

Not all encounters between logging engineers and water were pleasant ones. For F. Hill Hunter of Lamm Lumber Co., the assignment to build a four and-a-half mile tangent across Oregon's Klamath Marsh brought a series of misfortunes that gained the sympathy of the entire industry.

The plans were sound. Hunter first trucked to the site a Diesel clamshell shovel and the materials to build a huge scow. The crew went to work and soon had the shovel mounted on a 64-foot barge.

Adversity first appeared while the men were digging a 30- by 100-foot hole in which to float

the rig. Five feet of snow fell during the procedure.

On the day set for the launching, a sheet of ice six feet thick covered the hole. The dynamite crew went to work and blasted off the sheet of ice. But this served only to fill the hole with mud and ice, so the launching lake had to be dug out a second time.

Once afloat, the dredge encountered frozen ground along the right of way which lasted for months. Laboriously, the muck was scooped up from the marsh and laid in a roadbed six feet high and eighteen feet wide. Then a parallel canal had to be dug for drainage.

Working 24 hours a day, 7 days a week, the dredge finished the roadbed job—four months behind schedule. It was now October, with no time left to allow the bed to settle.

In desperation, trestles and rails were laid atop a mucky surface that wouldn't support the weight of a man. Additional cross ties were piled on until a roadbed solid enough to support a few loads of ballast was secured.

When the ballast-hauling locomotive cautiously felt its way along the tracks, the trestles, ties, "ground" and rails all sagged as much as 18 inches.

"The old lokey would come sloughing along looking like the Leaning Tower of Pisa," observed *The Timberman* correspondent assigned to report the epic. "The crews would cling to the upside, ready to jump if the locomotive took to the marsh. After each trip a crew would jack up the depressed side, put in more ballast, working like beavers between trips."

It took six lifts of ballast before stability was assured. By this time, the entire roadbed had settled to the rock bench 25 feet below the surface of the marsh.

The entire project had been accomplished four miles from any railroad.

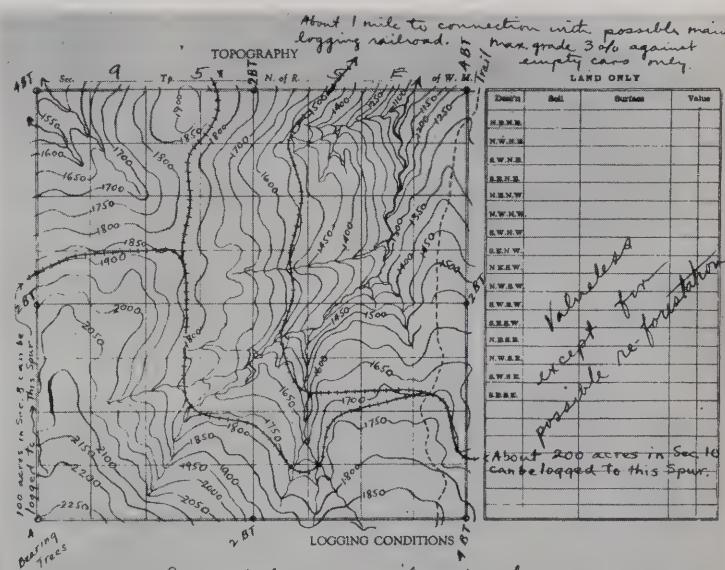
The spectacular achievements of the logging engineers helped to dramatize their usefulness in the woods, bringing a grudging admission from many operators that maybe they ought to hire an "S.I." for a try.

By 1918, the new profession had proved itself and the first logging engineering departments were set up by Weyerhaeuser Timber Co. and Shevlin-Hixon. On that occasion, the head of Big W's new department pointed out that "there is the most ample opportunity in the West for the exercise of the highest development of the logging engineer's skill, due to the topography of the country, the varied size and

character of the timber and the diversities of the weather."

But the logging engineer achieved respectability too late, or came at too high a price to have been considered by other than larger operators. Consulting engineers were available, but the great number of small loggers continued to do their own road-building. With the decline of railroads in the woods, the logging engineer's talents were switched to the challenges of truck and tractor logging. The profession survives today as the important mechanical arm of forestry.

CRUISER'S REPORT of logging conditions in a virgin stand of timber was the first step in planning a railroad. This was followed by an on-the-ground inspection by the woods boss and the logging engineer.



Proposed logging railroads shown ——
The timber in this section will handle to the North and West to a main logging road following approximately the South Fork of Chetachie River.

From such a main road, logging spurs could be located about as shown, which would not only permit economical logging of this section, but would also develop the 1SE $\frac{1}{4}$ of sec. 30 and most of the S $\frac{1}{4}$ of sec. 28.

Except for a little steep ground along creeks this is all good ground for logging either with high leads or with skidders.

allowed about 10% for breakage. There may possibly be a greater loss as to cedar.



ROADBED OF HUGE LOGS is perfectly adequate for this train of shingle bolts on a Washington operation about 1905.

"SWEDE POWER" was the mainstay of early logging railroad construction and maintenance. This photo at Yeon & Pelton's Columbia River operations in the 1890's shows a preponderance of crowbars and shovels. Hand jack held by man in center was used to move logs and to replace derailed rolling stock. Superintendent at right, rear, used bicycle type speeder. (Oregon Historical Society)





ROUGH-HEWN TIES were a feature of many logging spurs. Around 1910, this track gang was laying redwood ties and 30-pound relay rail through an area that had been logged 45 years earlier.

TRESTLING OF SMITH-POWERS operation clung to the precipitous hillsides of southwestern Oregon for a total of 20 miles. Wire cables at left "hog-tied" the piling to prevent it from shifting.





LOGS WERE A CONVENIENT and cheap method of filling when this structure was built around 1910. Bradley Logging Company's #5 Climax hauls a rail-mounted donkey engine near Cathlamet, Wash.

PUSHING STEEL

The logging operator knew generally where he wanted his railroad to go, but he sometimes had trouble getting it there. Canyons, rivers, mesas and steep mountainsides were sprinkled generously around the 11 Western states, making a timbered obstacle course that could put even the best logging engineer in the bight of the line. As logging settings crept into the back country, railroad building became the most difficult phase of the business.

In his war against hard-looking country, the railroad logger found that his best weapon was blasting powder. He used it lavishly, surpassing for a time even the mining and construction industries as the heaviest user in the West. It was taking an average of two and-a-half tons of powder per mile just to remove stumps from the right of way. The grading which followed took about as much.

Hammond-Tillamook Lumber Co. brought the average way up for the year 1927 when it tried to keep a new main line grade below five and-a-half per cent. Working around the clock with the aid of portable lighting plants, the construction crews removed as much as 16,000 yards of earth from cuts reaching 72 feet in height. At one point, a 280-foot long section was filled, requiring the handling of 17,000 yards of earth. It was more than enough material to fill the combined space covered by the Russ Building in San Francisco, the Smith Tower in Seattle and the Lumbermen's Exchange Building in Portland.

When Hammond-Tillamook's new 12-mile line was finished, the bill averaged out at \$25,000 a mile.

Smith-Powers Logging Co. upped its bill to \$75,000 a mile when blasting out a 1700-foot section of roadbed containing 32,000 yards of rock.

Loggers found that when a gap was larger than 10 feet wide, it was usually cheaper to build a trestle than to fill with earth.

For understandable reasons, logging railroad builders favored trestles and bridges made of wood, rather than steel or concrete. The choice was to account for some monumental results.

The honor of owning the highest wooden railroad bridge was claimed successively by San Francisco & North Pacific, with 137 feet in 1880; Caspar, South Fork & Eastern, with 146 feet in 1884; and D. A. Robertson, who trailed logs 202 feet above the waters of Charlie Creek in 1902.

Pacific States Lumber Co. in 1927 built a trestle just two and-a-half feet higher than Robertson's and assumed the temporary world's championship.

The fifth highest of all railroad bridges in the country was claimed by Simpson Logging Co. in the late '30's, but the achievement was scorned by other loggers. Simpson had committed the unforgivable blunder of building the 400-foot-high structure out of a wood substitute called steel.

No company had as much trestling as Smith-Powers Logging Co. Out of a 50-mile line, a total of 20 miles ran on piling built from two to twenty feet off the ground.

S. S. Somerville's entire roadbed at Napavine in 1910 was built on piling from one to six feet above the ground. His construction costs were kept to a modest \$1,306 per mile.

Boca & Loyalon boasted 77 trestles in its 56 miles and the Sonoma Lumber Co. line crossed Hulbert Creek 42 times in less than four miles. On the original line of California Western, trains ran over a bridge or trestle an average of once every third of a mile—for 40 miles.

Rising waters and sudden floods proved a constant hazard to the wooden crossings. The Pacific Lumber Co. had to contend with the Eel River, a seasonally violent stream which even today seals off U. S. Highway 101 on occasion. Tired of building replacements, the company anchored its Eel River bridge in concrete and rock and let the seasonal high waters flow



COOLIE LABOR, IMPORTED by the mainline railroads in the '60's and '70's, was later used by Loma Prieta Lumber Co. and a number of other logging operations. (SP photo from Amaragosa Memorial Library)

harmlessly over the top of the tracks.

Downstream, E. J. Dodge Lumber Co. won its winter battle with the Eel by discretion instead of valor. Each fall, its logging railroad tracks were taken up, and each spring relaid in the same riverside location.

Everett & Monte Cristo Railroad simply embedded its ties in concrete as a foil to the rising waters of the Stillaguamish River.

Most of the trestles were considered temporary. "The trestle was expected to fall down," said one engineer, "as the last train passed over it."

Some of these structures, "engineered" by loggers, and built by labor recruited from city skid roads, were viewed with something less than respect by the trainmen who had to cross them daily with loaded cars. In more than one instance, it was discovered that for good reasons of safety, the entire train crew would jump off the train before reaching a rickety trestle. The engineer cracked the throttle, and with the rest of the trainmen, made the dash down one side of the canyon and up the other to meet the train safely on the other side.

As logging progressed, the terrain became more difficult. The longest single trestle grew from Arcata & Mad River's 700 feet in 1884 to the 8,000 feet of Warren Spruce Co. in 1918.

Some of these structures contained the equivalent of a quarter-million board feet of lumber—enough to build a town of 22 six-room homes.

The climax was reached in 1942, when Weyerhaeuser Engineer Walter Ryan stepped

back to admire the biggest of them all. He had created a railroad trestle 1,130 feet long, rising 235 feet over Baird Creek. More than 600,000 board feet of treated lumber went into his masterpiece, which is in use today as a fire truck patrol road.

A few miles away, Charles R. McCormick Lumber Co. built the same trestle three times in the same place. It was one of the incredible blunders that can befall men in a hurry. The comedy of errors began with the spring floods of 1926, which washed out the company's trestle over the Cowlitz River. It was late in the era of railroad logging, and the company decided then and there to abandon the tracks for trucks. But first, the woods equipment left behind had to be retrieved. The trestle was hastily rebuilt and the camp, logging and railroad equipment was hauled across the Cowlitz. Trestle Number Two was then dismantled. With a sudden feeling of sickness at the pit of his stomach, the woods super realized that a pair of locomotives had been left behind on a siding in the woods. Grumbling crews were put to work building a third trestle, over which the orphaned engines made their final run to the other shore.

The story of McCormick's misfortune made the rounds of the timber country and probably caused many another bull of the woods to look twice before pulling up the tracks. The woods boss of North Bend Timber Co. had chuckled over the story, too, but little realized that he would provide its sequel. His subsequent action could only be accounted for by the fact that giant Lidgerwood skidders had become a fixture

of the woods. When moving to another setting, the North Bend tracks had been picked up and relaid at the new location. But when it came time to begin logging, the lack of a Lidgerwood became embarrassingly apparent. There was no alternative for the red-faced super but to tear up the new spur, relay it at the old location and repeat the process after the Lidgerwood had been moved.

In the best tradition of the woods, all such human errors were expected to be accompanied by a torrent of profane remarks, and undoubtedly were. The salty vocabulary of the woodsman also received some serious exercise over the matter of railroad tunnels.

Tunnels were usually avoided by the logger as too expensive or unnecessary. It was cheaper to go over the hill via switchback or incline, or more simply, to build the line around the hill.

A. J. Powers claimed that tunnels were make-work projects dreamed up by logging engineers. To avoid both, he boasted in 1916 that he had built five separate switchbacks in one 15-mile section.

The Coggins brothers in 1900 built a six-mile logging road composed entirely of a series of switchbacks.

In some situations it was tunnels or nothing, however, and the first one built for a Western logging road was that of Caspar Lumber Co. in the 1870's.

A few years later, a bull tunnel was carved through a hillside near Westport, Oregon, to permit passage of log-hauling oxen. It was later used by a logging railroad and is still on hand today, causing tourists on U. S. Highway 30 to puzzle over its purpose.

The 2,000-foot tunnel built under Table Ridge Bluff by Eel River & Eureka Railroad in 1884 was probably the longest of its day. But its fame was based on another fact of construction: it ran directly beneath a cemetery.

The 1916 Pacific Logging Congress was highlighted by a report from a proud construction engineer, who told of the geological difficulties connected with the successful completion of a tunnel for Columbia & Nehalem River. It was a challenging job, he related, taking 18 months

HIGH BRIDGE TRESTLE of California Western Railroad & Navigation Co. twisted "like a snake with a bellyache." The 600-foot long structure had reversed 24 degree curves on a 2.4 per cent grade. (Library of Congress)





SWITCHBACK on the main line of Oregon & Eureka Railroad in 1905 was a dangerous, but typical, combination of logging road grades and curves. (Forest History Society)

to complete. Among other feats, he had installed an elaborate system of pipes to constantly drain off the water which came from a quicksand formation above the tunnel.

"This was done," he told the attentive loggers, "in order to remove the cause of a permanently embarrassing result."

Two years later, a temporarily embarrassing result occurred when the tunnel collapsed. The engineer's failure served to strengthen the widely held opinion by loggers that all such experts belonged on the campus and not in the woods.

But the tunnel was necessary to keep logs moving to the mills, so Owner A. S. Kerry scouted up a more modest and competent engineer and built a tunnel that became a legend in the timber industry.

It was a model of safety. In addition to the revolutionary installation of signals at either end, the new tunnel sported tell-tales, the hanging ropes which warned trainmen of the approach of a tunnel.

After the 1918 collapse, a 400-foot long section of the bore was rebuilt to stay. Then Kerry installed a unique device to keep forest fires from entering the tunnel. These were overhead steel gates at either end, held in place by a chain with soft steel links. If a fire raised

the temperature, the soft links would melt, automatically releasing the gate.

In the 1920's, as many as a dozen separate logging companies were shipping their logs on the Columbia & Nehalem River line, and for years an average of a million board feet a day passed safely through the tunnel. At this time, Kerry's common carrier boasted an output of logs greater than any other railroad.

Hartford Eastern Railway negotiated a difficult nine-mile stretch between Granite Falls and Robe which required the building of eight tunnels. But only seven were completed. Tunnel Number Eight collapsed, and a permanent detour was built around the slide. Sealed inside forever are the bodies of seven Chinese workmen who were buried alive.

Aside from human life, the most costly tunnel of them all was comparatively short. It was hurriedly built by the Government's Spruce Production Division on the Olympic Peninsula. Cost was no object in 1918, when hundreds of men were assigned to run a bore for 460 feet through solid rock.

With timber growing close to the tops of the Rockies, Sierras and Cascades, it was to be expected that logging railroads would be lured to unusual elevations.

At one time, all railroad shows in Arizona and New Mexico were conducted above 6,500 feet. Both Hallack & Howard and Southwest Lumber Mills ran lines more than 9,000 feet high to log their pine holdings. The loggers around Lake Tahoe operated at elevations averaging 6,000 feet, with the Carson-Tahoe Lumber & Fluming Co. topping the Sierra summit with its lumber line at 7,000 feet.

Sumpter Valley Railroad rose to 5,238 feet above sea level, but climbed 2,000 feet in 12 miles to do it. Sugar Pine Lumber Co. managed a similar climb in only 11 miles by building a steady 4½ per cent grade. Curtiss Lumber Co. had to make 1,200 feet in elevation in only 6 miles.

The grades of Class I railroads across the country average less than one per cent, with maximum rises of about two per cent necessary in mountainous terrain. The steepest climb is 4.7 per cent, used by Southern Railway to negotiate Saluda Hill in the Blue Ridge Mountains.

But the standards of the Eastern road builders were only a starting point for loggers west of the Rockies. After all, they faced terrain so steep that even chipmunks had to double-head to get up the hill.

To avoid building tunnels, trestles, switchbacks or inclines, the loggers preferred to grapple with the terrain in a straight-forward manner. Saldern Logging Co. and Mendocino Lumber Co. were using 12 per cent grades at the turn of the century. Sultan Railway & Timber Co. went to 13 per cent; Forks Logging Co. to 14 per cent. Cameron Logging Co. tried 18 per cent and made it.

Even though a few roads were obliged to employ short grades of up to 14 per cent into the 1920's, the use of steep climbs was falling into disrepute. The sharper grades often required "doubling," in which the train was separated into two or more units to make ascent possible. And too many logs and locomotives—to say nothing of lives—had been lost on the dangerous grades. In their last 40 years, the logging roads tried to keep their maximum pitch below seven per cent.

Curves offered another headache to the railroad builder in mountainous country. Even with the best engineering advice available, California Western, for example, found it necessary to build a 40-mile road without a straight stretch of track longer than a mile.

"What is the curvature limit on your line?"

a small operator was once asked. "I don't know," he replied, "as I've never reached it."

The Sumpter Valley line in its 80 miles made an average of three-quarters of a complete circle every mile. Curves of up to 40 degrees were not uncommon on logging lines and a few of them twisted into a hair-pinned 70 or 80 degrees.

The sight of a train negotiating such rights of way on North Pacific Coast Railroad in the 1870's inspired Pioneer James Fowler to observe:

It twisted in and twisted out
And left the travelers still in doubt
Whether the snake that made the track
Was going up or coming back.

A similar reaction was reported by the California correspondent for *Columbia River & Oregon Timberman* in 1900, when he first saw the 13-mile narrow gauge line of West Side Flume & Lumber Co. "The new road is sinuous," he announced, "and can best be compared to a succession of the letter S in reverse and inverse form."

While the loggers found that a curved line was the easiest and cheapest route between two points, the practice contained some built-in problems. There was the added resistance, which was equivalent to a 0.4 per cent grade, for example, on a 10 degree curve.

Another drawback was the need to bend the rails. Most logging operators were not equipped to lay curved rails, and straight rails laid on curves brought slippage and equipment derailment.

The most compelling objection to excessive curvature was the added cost. As always, the dollar sign made the final determination of a logging road's character.

Financial considerations caused the timbermen to hire low-cost manual labor for road work well into the age of mechanization. Most of the time, right of way clearing and grading was done with "Swede power." Often the logger employed the "station" system, in which a man was given a contract to grade a station, or 100 feet of roadbed, at a time. Cost of grading each station ranged from around \$50 in the early days to several hundred dollars later.

The term "Swede power" was not quite accurate. While Scandinavians predominated in Western logging, as they had in the Lake states, they could claim no monopoly. At one time or another, the racial roll call included railroad gangs composed of Bulgarians at George Palmer Lumber Co.; Piute Indians on the Bodie & Ben-

ton; and Japanese and Bulgarians at Hammond Lumber Co. Hindus were sprinkled among the road crews of several companies. Chinese, who had proved their value in building the transcontinental mainlines, were commonly used on the lesser roads.

The employment of "coolie labor" meant the lowest possible costs to the operator, but it wasn't always well-received by others in logging and railroad crews.

This fact of early Western life was discovered by Union Lumber Co. in 1891, when their tunnel-building plans came to a violent halt. White citizens had rioted, objecting to the Chinese labor brought in from the outside. The Orientals were driven out of town.

The crowd was pacified only when Sheriff Standley of Mendocino County pointed out that not a single white man had responded to Union's appeal for local labor. The Chinese drifted back and completed the tunnel, 1,129 feet long through hard rock, without further incident.

The management of Union Lumber Co. could have profited by the similar situation which Bodie Railway & Lumber Co. had experienced 10 years earlier.

A menacing mob had gathered for the popular pastime of driving Celestials away from their work. An alert superintendent rounded up his Chinese crew and hustled them off to their camp near Mono Lake. There they were loaded on rafts and hauled out to an island in the lake by the lumber company's steamboat. They had with them all the camp supplies, including water, and were prepared for a month's siege if necessary.

The self-styled vigilantes were in hot pursuit. They walked the dusty 21 miles from town to camp with a speed born in the heat of fury. But enthusiasm cooled as temperatures rose. Upon arrival, the disappointment of finding the Chinese gone was soon forgotten in the greater misfortune of discovering that the camp water supplies had also vanished.

The alkaline water of Mono Lake has always been unpalatable and the nearest drinking water was located at the foot posse's starting point—21 miles away. As the bedraggled citizens wandered back during the next 24 hours, it is reported that the saloons of Bodie did their all-time greatest business.

Local citizens never again bothered Bodie's Chinese laborers, which might be credited to another preventive move by their superintendent. Without warning, the coolies were fired

from the job when construction came within a few miles of town. White laborers were hired to replace them, the thoughtful superintendent explained to his superiors, "Because there was a very strong miner's union in Bodie."

J. Houghton Logging Co. had its unpleasantness in 1906, caused this time by Japanese section hands. The entire crew of loggers left the woods in protest against the hiring of foreigners. In a day before labor unions, Houghton settled the matter simply by hiring outside strike-breakers, and the old crew gradually returned.

The 75 Italians who left Saginaw Timber Company's payroll in 1915 never did return. They were called back to their homeland for service in the War.

When Cady Lumber Corp. was laying an average of 50 miles of steel each year, it had railroad crews consisting of Americans, Mexicans, Negroes, Apache and Navajo Indians. All races worked in harmony—except the Indians. The woods super soon learned that the two tribes were traditional enemies, and Apaches and Navajoes would never speak to each other, much less work in the same gang.

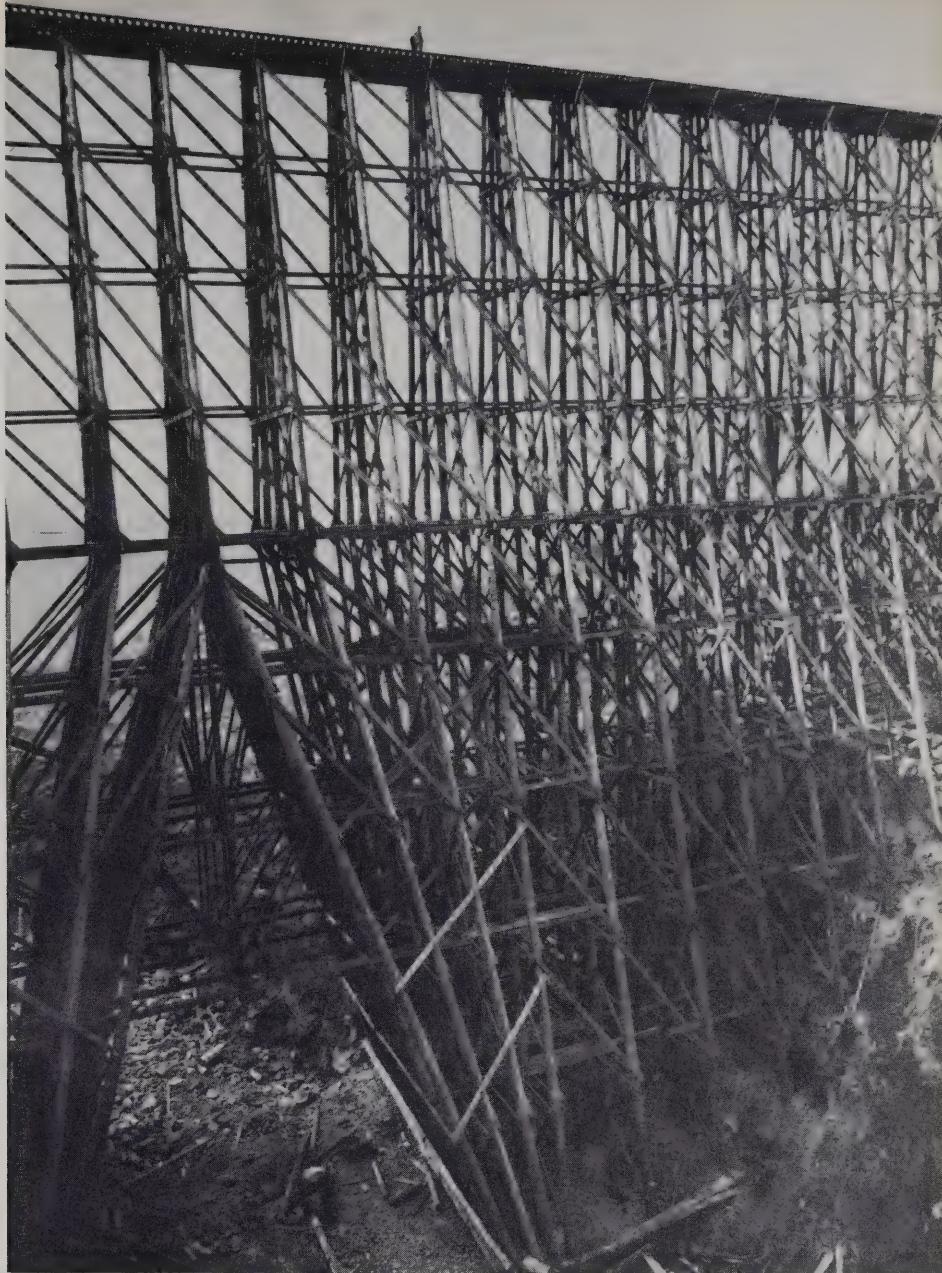
Low cost labor, of whatever nationality, was one reason that modern construction machinery was slow in coming to the woods. Into the '30's, a familiar piece of grading equipment was the Bagley Scraper. This was a simple scoop shovel unit manipulated by cables attached to a donkey engine or locomotive. Developed by John Bagley of Tacoma Eastern Railroad, it was a substitute for the steam shovel which could be afforded only on larger road-grading operations.

By the time that the crawler tractor bulldozer became practical, the pace of logging railroad building was on the decline.

Pioneering the use of tractors for grading a Western logging road was Schafer Bros. Logging Co. The honor was claimed in 1919 when they put four Clevelands on the job.

Large numbers of men were sometimes employed in railroad building. The reason might have been to get more logs to meet a sudden upturn in the demand for lumber, or more often, to convert the timber to cash in meeting a financial crisis.

Construction crews of a hundred men were not uncommon. Albion Lumber Co. in 1902 had 750 men working on its 20-mile line from Albion to Boonville. C. A. Smith Lumber & Manufacturing Co. in 1913 was using 2,000 men exclusively for road construction. During World War I, the Spruce Production Division put 4,200



HIGHEST LOGGING TRESTLE in the world was claimed by Pacific States Lumber Co. between 1927 and 1942. It towered 204 feet over the waters of Cedar Creek, near Selleck, Wash. If laid end to end, its 508 piles would have stretched more than seven miles. (Oregon Historical Society)

civilians and troops as well as 600 horses to work building railroads and camps in southern Oregon. On all its 13 railroad projects the war-time agency at one time used 10,000 men.

Up on the Olympic Peninsula, the government spruce road was taking shape at a rate 75 per cent faster than any other American railroad was ever built. By working night and day, seven days a week, soldiers and civilians in a few months were able to build 45 miles of main line and 124 miles of logging spurs. Not a single log was hauled over the road before the Armistice ended the project.

Never again was the need for logging railroads so urgent, and the record of an average of two miles of line completed each day was never equalled.

Another record was set by the Spruce Division's railroads—they were probably the most expensive in history. While a Congressional investigating committee discovered that it was difficult to ferret out the actual costs, experienced loggers estimated the expense to average about \$30,000 a mile.

The per-mile cost was the same price Noyo & Pudding Creek Railroad paid in 1881 to build

its entire two-mile line and equip it with locomotives and rolling stock.

While other railroads occasionally found their construction costs approaching \$50,000 a mile for short stretches, the cost was far above average. In the 20th century, railroad construction costs varied all the way from \$750 a mile to \$80,000, depending on the topography. A government survey in 1937 found that main line logging railroad building in the redwood region was averaging \$15,000 to \$20,000 a mile; spurs, \$10,000. In the Douglas fir region, average costs then were 10 to 20 per cent lower.

The logging roads consumed large sums of

money, but under proper management, there was never a question of their short-term profitability.

By the 1930's, the West's most accessible timber had been logged off, and construction and equipment costs required an initial investment of \$50,000 for even the shortest woods road. Some lines built by large companies turned into million-dollar projects.

High costs, more than any other factor, brought the end nearer for logging railroads. Only the largest corporations today find that the unit cost of hauling logs by rail is still cheaper than by truck.

VANCE CREEK BRIDGE of Simpson Logging Co. was the fifth highest of all railroad bridges in the world when it was built in 1928. The 450-foot high structure is still used by Simpson's Peninsular Railway.





MAYFIELD BRIDGE of Cowlitz, Chehalis & Cascade Railroad became unsafe in its old age. Farrow photo of the last train in 1955 shows that the crew has abandoned the head end locomotive and caboose. They are in a locomotive at the rear, pushing the heavy Number 20 across the bridge. When the leading engine was safely on the opposite bank, crew would walk across the bridge, get up steam and pull the rest of the train across.



TRAIN of Clemons Logging Co. winds toward the mill through land logged 20 years earlier. In 1941, the old Clemons property was converted by Weyerhaeuser Timber Co. into the world's first tree farm.

BAIRD CREEK TRESTLE at Weyerhaeuser Timber Company's Longview operation was the largest ever built for a logging line. It contains enough treated timber to build a town of more than 60 houses.



THE UP AND DOWN RAILROADS

A lot of the West was made standing on end, the logger discovered. To best it, he developed the incline system—the most audacious collection of vertical railroads ever known.

Rising costs of construction as well as rising terrain made the incline necessary to the logging business. It was primarily an alternative to the building of expensive tunnels, switchbacks and contour routes. But the incline would prove to be the peculiar mark of the Western railroad logger; his pride and his glory.

The first logging incline of record was built on the north fork of the Cosumnes River at the foot of the Sierras in 1852. At a pitch of 45 degrees, it lowered log cars 1,000 feet down the hill by a rope and pulley arrangement.

The expedient was probably inspired by the small mining tramways in operation nearby. All used a system which would prove of value for log-handling into the 1940's. Loaded log cars were let down the hillsides by gravity and empty cars taken up by power or reciprocity. A variation made use of a traveling cable car which eased the cars up and down.

The decline was a reversed incline, hauling loaded cars up a hill instead of down. Both were constructed for the same reason of economy, with the decline sometimes being teamed with an incline (which became a double incline) to eliminate the need for a costly bridge or trestle across a canyon.

The introduction of wire rope in the 1890's made powered inclines practical. John Yeon, logging above the steep bluffs of the Columbia River, was one of the first to combine an engine with gravity. He developed a compressed air rig with a pair of hydraulic cylinders which used oil as the liquid agency.

From the earliest days of "dropping machines" and "log slide engines," it was to be expected that Western loggers would soon be outdoing each other to build inclines of superlative lengths, heights and grades.

The grade, or gradient of a railroad track is

the rate of ascent or descent. A level track is rated at zero per cent. One with a rise of one foot in 100 feet of track would be known as a one per cent grade. While the 45-degree angle of 100 percent is practically impossible, some of the logging railroads flirted daringly close to it.

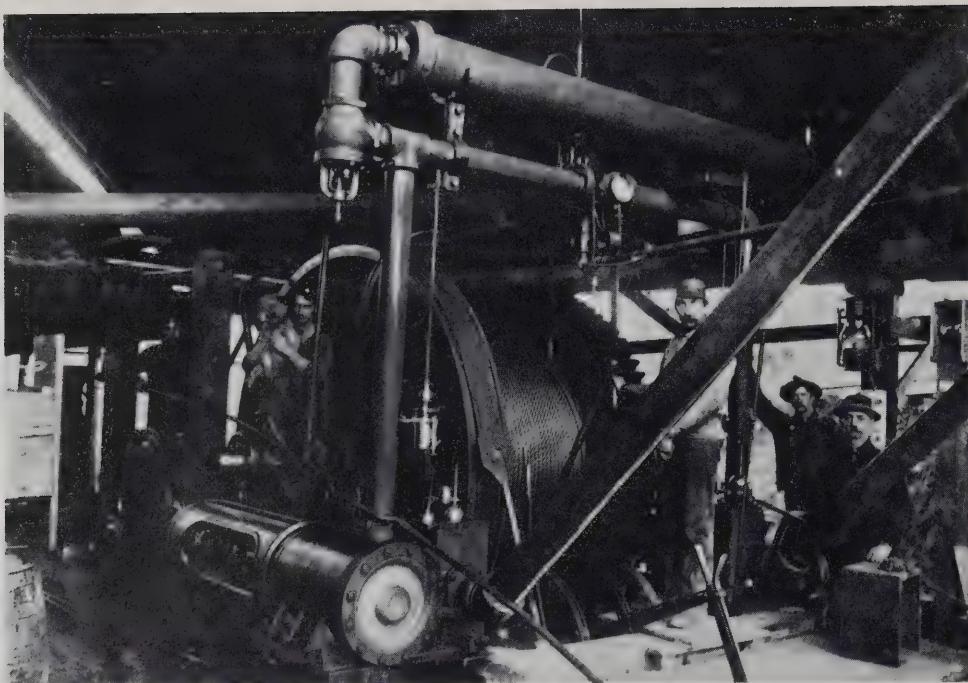
Grades of 60 to 70 per cent were used at one time or another by Marysville & Northern, Porter-Carstens Logging Co., Warnick Lumber Co., Roach Timber Co., Diamond Match Co. and Saginaw Timber Co. In 1930, West Oregon Lumber Co. leaned an incline against the hill at 74 per cent.

Wisconsin Logging & Timber Co. claimed the steepest incline of the day in 1916 when it built a 2,000-foot long cableway with a maximum grade of $66\frac{1}{2}$ percent. Some of the glory was removed four years later when Basin Logging Co. created what it called the largest incline. It was 6,800 feet long, with a grade of 65 per cent.

"The steepest in the world" was the boast of Hogg-Houghton Logging Co. later in the '20's when it pitched an incline at 65 per cent. The title held until 1930, when Wood-Knight Logging Co. came up with an incline 6,600 feet long having a minimum grade of 20 per cent and a maximum of 76 per cent.

All such claims, no matter how valid, were shadowed by the mightiest incline of all time. It was built in 1912 by Yosemite Valley Railroad for its subsidiary, Yosemite Lumber Co. From a timbered crest 3,100 feet above the waters of the Merced River, a right of way slithered for 8,300 feet down the mountainside. Rocky outcroppings made it necessary to put in a curve and to slant the maximum grade at a breathtaking 78 per cent.

One car negotiated the drop every eight minutes carrying 30 tons of logs. Each of the 100 cars was specially built with a bulkhead at one end to keep the logs aboard. They were hinged



INCLINE OF YEON-PELTON CO. at Rainier, Ore., was the first successful adaptation of the powered cable railroad for logging. (Below) Loaded log cars were lowered three at a time by this huge compressed air rig. (Oregon Historical Society)



in the center with ball and socket plates to smooth out the humps.

Yosemite Lumber Company's triumph over Nature was in use only a few years before the surrounding timber supply dwindled. The incline rails, ties and engine were then moved to the west side of the river where they made up a cableway of lesser spectacle.

By the 1920's, several logging outfits had installed inclines which surpassed Yosemite's in length, but with only about half the grade. One was the gravity railroad of Bohemia Lumber Co. which stretched for two and-a-half miles. Another was High Point Mill Company's 9500-foot incline which used poles for rails.

Galbraith Bros. Logging Co. also had a pole road incline and built a special log-hauling car for the purpose. It had 14-inch wide wheels with double flanges to accommodate a track of six-foot gauge. Each wheel had six inches of side play to compensate for irregularities in the log rails.

Lyle-McNeil & Co. and Laird & Garrett were contemporaries with similar arrangements who helped to make a fad of the pole road incline in the mid-'20's.

In this period, a logger felt himself a failure if he didn't own an incline. Some unfortunates caught on flat ground were so embarrassed, *The Timberman* magazine relates, that they

went out and bought a mountain so they could build inclines and regain their self respect.

The mixed-up terrain of California's coastal redwood region was well-suited to inclines, where the long yarding methods, swings and sky-lines used in the pine and fir regions were often impractical. The logging manager of Northern Redwood Lumber Co. said in 1924 that "we intend to build enough inclines to permit us to yard in an area less than 1,000 feet, and load logs directly on the cars."

Nearby, The Pacific Lumber Co. was doing just that, using one decline and three inclines which aggregated nearly three miles in length.

Expensive as some of the inclines were to build, they represented the lesser of several evils. Hammond Redwood Co. put in a double incline in 1940 that cost less than one of the three bridges required if it had built a spur from the main line across the river.

A pair of electrically operated inclines installed by Diamond Match Co. in 1927 eliminated 20 miles of difficult road-building. Two inclines saved Basin Logging Co. a haul of six miles. One incline cut three miles off the haul for Roach Timber Co. and Wisconsin Logging & Timber Co. avoided four miles of switchbacks with its 2,000-foot vertical railroad.

Once installed, an incline saved the operator an average of \$1 per thousand board feet of logs hauled.

Sugar Pine Lumber Co. saved even more by rigging up a portable incline machine. Its two 750-ton electric motors were mounted on rail cars and could be moved from one incline site to another.

Because the sidehill railroad was sometimes the only means of reaching remote camps and settings, it experienced some strange commerce. Woods locomotives occasionally went up and down the incline, but not under their own power and certainly not with the crewmen aboard. They'd rather walk at a safe distance above the old coffee grinder, thank you, in case a cable broke under the strain.

If the woods camp was located beyond an incline, it meant that all supplies had to come up the roller coaster. Entire camps on wheels sometimes took the same precarious route.

The position of the camp in relation to an incline was of greater portent to the men who would have to travel over it to get to and from work or town. To some loggers, it was exhilarating sport to take the incline and look out on the timbered scenery from the slowly moving

escalator. It was a rare sensation to find oneself standing up while lying down. Others dug in with their caulked boots and hung on for dear life, a display of caution heartily endorsed by the logging operator. In not a few instances, job-seeking loggers were required to sign a waiver absolving the owner of accidents on the incline.

Aside from prayer, about the only overture to safety that found common usage was a signal system of some kind. The earliest version consisted of a team of young camp flunkies, who were stationed at intervals on the hillside. To stop, slow or start the cars, they shouted signals up to each other and eventually, to the incline engineer.

A refinement was the use of a steam whistle located at the power hoist. By means of a long cord paralleling the incline, the whistle punk could make his signals heard by the engineer in spite of the clatter of the hoisting engine.

A common practice was to string a pair of low voltage electric wires alongside the tracks. By shorting the circuit with an iron bar, the traffic control men could cause a bell to ring or a light to go on at the engineer's station.

At the top of Yosemite Lumber Company's first incline, an indicator was placed on the snubbing engine so that the engineer could keep track of his three-mile-long cable.

While runaways on the incline were inevitable, it was more often the presence of cables that caused concern. Should a break occur, the men working around the incline were confronted with an unpredictable steel snake with a sting of death that might lash out a half mile or more.

Because the cable received more wear on one end than another, it was necessary to reverse it from time to time. This could be a tedious and dangerous job. Temporarily unanchored cables were known to slip down the hillside of their own momentum, carrying some of the crew along.

Like the rest of the railroad show, the colorful inclines were gradually supplanted by truck roads, even in the redwood region. By 1950, not a single logging incline was in use. One of the few places where outsiders could get a glimpse of a working incline lasted until 1941. It was the 6,300-foot cableway of California Barrel Co., which crossed the Arcata-Redding highway on a trestle before climbing the hill at a 50 per cent pitch. It had become a tourist point of interest rivaling the many others in that scenic area.





INCLINE RAILROAD of Yosemite Lumber Co. (left) was the most spectacular of them all. Loaded log cars were lowered 8,300 feet down to the main line of Yosemite Valley Railroad, at a grade which reached 78 per cent.

THIRTY TONS OF LOGS came down the Yosemite Lumber Co. incline every eight minutes in cars hinged in the center to negotiate the humps and curves.

WALKING THE INCLINE was considered by some loggers to be safer than riding the cars. Man at left has the typical blanket roll pack of the pre-World War I era.

SESSOMS' LOWERING CAR was a variation of the incline railroad which eased itself down the hill by means of drums located in the log car and at the control station.

PILE OF JUNK is all that remains of Locomotive Number 24 which fell victim to a parted cable while trying to climb the Pacific Lumber Company's Ferrott Creek incline.





RIDING THE INCLINE was an occupational hazard that faced loggers twice a day at many operations.

TRACKS TO THE TIMBER

A trip on a logging road was reminiscent of Evangelist Billy Sunday's Ford, according to a logger's joke of the '20's, because it shook the devil out of you.

Those who would complain about a sub-standard roadbed were told in salty language that the logging pike in question was not scheduling the Super Chief, and it seemed to be bringing in enough logs to keep the mill running. There was no other reason for the existence of most Western logging roads and thus no reason to overbuild. Economical construction was the everlasting priority consideration.

Aside from labor, rails generally represented the highest cost of putting in a railroad. Many early loggers economized by using wooden rails brought up from the mill. In some cases, the hauling in of heavy steel rails to locations distant from any railroad was a prohibitive expense.

"A few companies," wrote Fleming in *Narrow Gauge Railways in America*, "have availed themselves of wooden rails, made of hard maple, set into the ties, which are notched to receive them, and made fast by wooden keys. The rails are three and-a-half by six inches, and as long as they can be got, and are spliced with a lap joint, held fast by two bolts."

"The wear of the rails thus far has not been sufficient to furnish statistics in reference to their life," Fleming concluded in 1876.

Statistics weren't necessary for the railroad logger to reach the conclusion that his heavy loads called for more than wooden rails. One of the major disadvantages, as Lake Valley Railroad discovered, was that the wood wore down between the knots, making for a bouncing, lurching, stomach-turning ride.

Duncan Mills Co. was one of the first to use an innovation known as strap rails. Strips of iron about a half-inch thick and three inches wide were laid over its six-by-six timbered rails.

Arcata Transportation Co. stuck with strap rails until 1883, finally discarding them for all-steel rails.

C. C. Masten operated a geared locomotive on wooden rails until 1900, permitting the luxury of strap iron protection only on curves.

For nearly 60 years, there was usually a logger somewhere in the West who persisted in the use of wooden track.

One of the last and more heroic efforts to use the native product for rails was made in 1926 by Horton Lumber & Timber Co. The plan was a simple one. Series of 2x6 timbers, spiked together, were laid on the ground without ties or ballast. Because wear from locomotive wheels is hardest on the inside bearing surface of any rail, the three timbers were designed to be turned over and rotated. This provided up to 12 different bearing surfaces for each rail.

Basically, this was the Autorail System invented by A. W. Arnold in 1923, which called for the use of a converted truck locomotive. Rubber-tired locomotive wheels were recommended to assure traction.

E. J. Horton shunned the lowly truck and chose instead a conventional 14-ton Davenport locomotive.

Before the dark days of 1930 ended the enterprise, Horton had made a good start on his wooden railroad. The Depression caught him with two locomotives and 17 miles of track laid toward his goal of 22 miles between Junction City and the Lake Creek mill. Today the abandoned rails may still be seen on their lonely path into the Coast Range foothills east of Junction City.

Pole roads, which employed parallel logs for tracks, were another substitute for steel. They were used for logging purposes into the 1930's. Most of these inexpensive lines were laid without benefit of grading or ballast and boasted outsized gauges for better stability.



ROADBED OF LOGS was used when gravel fill was unavailable. Overstuffed little Baldwin narrow-gauge locomotive brings in a special order of timbers on the Yeon-Pelton Logging Co. line in the late '90's. (Oregon Historical Society)

But most loggers found the conventional type of metal rails to be the most efficient even for operations of short duration. And, after all, the steel or iron product could always be resold to another operator or the junkman.

Most lumbermen wrote off their experiment with timber rails as a loss, and switched to iron or steel as soon as they became smart enough or prosperous enough.

In the case of Caspar Lumber Co., a shipwreck near San Francisco in the 1870's provided the opportunity. The ship had gone down with a cargo of new steel rails from France, and the salvager offered the rusty lot at a bargain price because of their odd size and weight. No respectable railroad would buy the junk rails, but Caspar did. Crews were soon at work ripping out the lumber company's strap rails and laying down the French steel. While the replacement proved to be an improvement over wood, the exotic rails continued to develop flat spots until the line was abandoned in 1884.

Other bargains in rail were eagerly grabbed up by economy-minded loggers. American River Land & Lumber Co. made use of old street car rails from San Francisco, and Pelton-Armstrong Logging Co. laid down the tired old rails that had once graced the streets of Albany, Oregon.

There were other methods of cutting costs on rail.

Nearly \$30,000 in freight charges was saved by Snohomish, Skykomish & Spokane Railway in 1891 when it ordered brand new rails delivered around Cape Horn by sailing ship instead of freighted overland.

Used rail, called "relay," was commonly applied by the logger. It might have been 10, 20 or even 30 years old, but it was cheap. It would probably be usable another 5 or 10 years, or "as long as there was a streak of rust on the ground."

Spur rails, usually lighter than the logging main line rails, were picked up and relaid over and over on new spurs.

When Al Powers pulled the pin at his Minnesota logging camp and came to Coos County in 1908, he insisted on bringing his rails with him. They had been made in 1878 by Gorghum Co. in Germany. Minnesota & St. Louis Railroad Co. had made good use of them for 18 years before selling them to Powers. When the last of the relays were pulled up on the Smith-Powers Logging Co. line in the '20's, they had seen a rugged half-century of service.

Steel rails had replaced iron on mainlines by 1900, but the Seattle Steel Co. ran at capacity into the middle of the next decade, turning out 75 to 100 tons of iron rails a day for logging roads.

A common method of cost-cutting was the

leasing of rails from mainline companies. As the large common carriers replaced their old rail with heavier weights, the relay was profitably rented out to the logging lines along the right of way.

Locomotives became heavier over the years and the weight of rails had to be increased. Where 30 pounds to the yard was the average before 1900, weights of 40 to 50 pounds were the accepted standard 30 years later. Main line logging rails were usually heavier, and the surviving lines today use steel weighing 70 to 90 pounds or more.

Too many accidents were happening as the result of undersized rails when the California Industrial Accident Commission in 1917 came out with a regulation specifying a minimum weight of 30 pounds on logging spurs.

Logging Engineer Walter Ryan had a more specific recommendation. He told the Logging Congress that the minimum weight of the rail per yard should be not less than the locomotive

wheel load divided by 300. That meant that 60-pound rail would be safe for an engine of 54 tons and six drivers; or 72 tons on eight drivers; or 108 tons on 12 drivers.

Because loaded log trains move only in one direction, creeping rails have always plagued the log-hauling railroad. To add to the problem, steel rail will expand a quarter of an inch with a change of 100 degrees in temperature. While such temperature ranges are rare, a variance of even 50 degrees from season to season means a movement of a quarter of an inch at the points where two rails meet. Expanded rails, especially, were the cause of many a derailment on hastily constructed spurs.

A committee of the Pacific Logging Congress conducted a survey among its members who operated railroads shortly after World War I. Among the questions was one which asked, "To what extent and what kind of rail braces do you use?" Shining brightly among the prosaic responses was one from a haywire operator who

TRACK-LAYING MACHINES first appeared on logging roads about 1900. In spite of subsequent improvements, a good steel gang could often lay or pick up rail faster than a machine.



revealed, "I only put them in when the rail turns over more than three times at one spot. It has the habit by then," he concluded, "and it takes a brace to break the habit."

The habit was particularly noticeable on the Smith-Powers line. It had been built for many miles on steep hillsides, where sliding and shifting earth caused "running" rails. Twenty miles of it had been trestled, but even the trestle pilings were vulnerable.

There's always plenty of wire rope around a logging camp, so Al Powers put it to use. Old cable was used to lash the trestles and rails to tree stumps on the sidehill above the right of way.

Reports of the strange lashup reached the chief engineer of Southern Pacific, who found an excuse to make an inspection trip.

"This is certainly a new idea," admired Chief Engineer Hood. "I have heard and seen a good deal, but it takes a logger to hog-tie a sliding country with baling wire."

Wandering rails were the cause of lasting embarrassment for personnel of Northwestern Railroad Co. In 1901, a private car carrying the line's directors derailed near Duncan's Mills. The train's speed had been too slow to cause any physical injuries. But there were mental sufferings when it was later admitted that rails on the curve had been fastened down with bent nails instead of track spikes.

More cautious operators resorted to a guard

rail on sharp curves. This was a third rail laid inside the running rail as a prevention against derailments. Rails of heavier weight were often laid as additional curve insurance.

"Our problem is not so much bending the rails," one timberman reported, "but straightening out the ones we have."

Rail-straightening developed into an industry of some importance in the West. A number of people made their living visiting logging camps and removing kinks, curves and assorted blights from the tracks.

Following such a treatment on one logging line, the crummy was making its first trip over the newly straightened rails. A logger, unaccustomed to the comparatively smooth ride, is supposed to have shouted to his companions, "Hit the brush! She's off the tracks!"

In addition to suitable rails, mainline railroad companies considered ties and ballasting to be essential elements of a proper roadbed, refinements which logging lines sometimes treated with indifference. A number of early operators dispensed with both alleged necessities by laying logs lengthwise on the ground and attaching rails along the top.

At the Youngs River camp of Crown Willamette Paper Company, a clever foreman once built a spur on air. He'd run out of flat ground at the spar tree and looked around for a place to maneuver his log cars. Nearby, he found a large tree growing up from the steep hillside below. The ends of two long logs were propped

POLE ROADS, such as this one in Western Washington, could be built at a cost of \$100 to \$200 a mile in the last century. Climax sold a number of its Class A locomotives with double-flanged wheels for use on the log "rails."





TRIPLE HEADING was necessary on Brooks-Scanlon Lumber Company's 50-mile haul into Bend, Ore. Grade reached a maximum of four per cent.

on the spar knoll and fastened at the other end to the tree. Ties and rails were added to the horizontal logs and the foreman had his new "end of steel" running 150 feet out into space.

On the spurs, most loggers would try to get by without ballasting. "We just let the locomotive engineer dump his ashes where he thinks they're needed to settle the roadbed," explained one operator.

Sometimes, ballasting material just wasn't handy. Even such well-financed operations as Clearwater Timber Co. found it necessary to lay poles under the ties because of the scarcity of ballast.

In 1923, C. R. McCormick Lumber Co. was enthusiastic about cedar slabs for ballast. The lumber mill trimmings were split up into three-foot lengths, an inch and-a-half thick, and slipped under the tracks as shims.

"Once in awhile the slabs mash down and the following year we add a few on top," Manager P. E. Freydig related.

As for ties, they were never hard to come by in the timber country, and may have been hewn at the site from trees on the right of way. Usually they were squared up, but were sometimes left in the round.

The immense problem of supplying ties for 100 miles of railroad faced Weyerhaeuser Timber Co. in 1927 before it could bring in logs for its proposed mill at Klamath Falls. With admirable Teutonic thriftness, the company first built a portable sawmill on a railroad flatcar, then put it to work turning out the thousands of ties needed to start the larger operation.

The standard-sized tie of seven by eight inches will last from five to eight years on main-line service. Treating with creosote, zinc chloride or other preservative doubles the life expectancy.

This advantage was first explored in logging country by Diamond Match Co. They had been producing treated ties for Southern Pacific and in 1902 decided to try them on their own line.

Despite their proven superiority, treated ties were not widely used on logging roads. Replacement ties were handy and cheap and treated ties lasted no longer than untreated during their short, grueling life on logging spurs.

Ties were often picked up and relaid on new lines, although not as frequently as were rails. It was only during hard times that operators found the cost of labor in reclaiming old ties to be cheaper than production costs in securing new ones.

Ties were worth a dime apiece prior to World War I, and about 30 cents in the 1920's. They were often left to rot after the rails had been pulled, their only value being to provide the curious with evidence of the paths of the past.

On rare occasions, used ties had an intrinsic value. For a brief period at the beginning of World War I, Great Britain bought up large quantities for building trenches in France. Thirty-four years later, Union Lumber Co. sold its old redwood ties to a local manufacturer of architectural millwork.

How far apart he spaced his rails became another means for the logger to express his individuality.

The arbitrary standard gauge used by the mainlines had been determined 2,000 years ago by Roman chariot makers, and a large number of logging operators set out to improve on it.

"Our railroad may not be quite as long as some, but it's just as broad as any," was a favorite wheeze of the railroad logger. Some, however, overcame the implied shortcomings in length by resorting to exotic and superlative widths.

The term "narrow gauge" commonly meant a span of three feet between rails, although it necessarily applied to anything smaller than standard. The slim gauge logging lines came to full flower in California prior to World War I. Of the several hundred narrow gauge loggers in the West, more than half were located in California. It was largely due to the influence of yard-wide mainline roads that traversed the redwood belt.

The standard railroad gauge of four feet, eight and-a-half inches wasn't adopted by the major railroads of the country until 1886. While it affected those loggers having interstate carriers and interchange with large mainline roads, there was nothing mandatory about the measure for most of the woods lines.

When deviations from the standard gauge were built, it was for a number of practical reasons. Or so the builders believed at the time.

A king-sized distance between rails was thought by some to offer more stability to the train and to permit bigger loads on wider cars. Others supported the narrower gauges for the simple reason of economy.

Many of the strange gauges were inherited. Rolling stock purchased second hand may have perpetuated an earlier owner's version of the ideal gauge.

MALLET POWER was needed by Saginaw & Manistee Lumber Co. to tackle the eight per cent grade out of Bellemont, in Arizona's 9,000-foot high San Francisco Peaks area.

Arcata & Mad River Railroad's strange spread of 45½ inches was never duplicated by any other railroad. It was supposed to have been determined by the size of the handiest set of wheels available at the time. No doubt this was the casual method by which a few lines chose their gauge. But the likelier story of the origin of A. & M.'s unusual span is that it was the distance between stringers on a two-mile pier used by its horse-powered predecessor line.

When it was common practice to trail logs behind a locomotive, dragging the load over the ties, the wider gauges were useful in handling large logs.

Horses, and even oxen, contributed to oversized gauges. Some operators used animal-driven railroads before steam power was practical. A gauge of six feet or more was necessary to permit the teams to walk between the tracks. When the switch was made to locomotives, the team-sized gauge was retained for convenience.

The huge size of some early homemade steamers, particularly on pole roads, accounted for other variations.

In 1871, a statistician reported that there were no less than 23 different gauges in use across the country. By the time that standardization came in 1886, the number of variations had reached 25. Most of them were found in the Western woods.

The early wooden rails of Duncan's Mills Land & Lumber Co. spanned five feet, five inches. Nearby, the Gualala River Railway topped that by three and-a-half inches.

Albion Lumber Co., a few miles up the California coast, won the local battle of gauges by laying its rails six feet apart—exactly twice the width of narrow gauge.



Seven-foot gauges were employed in the 1890's by Millet & McKay and C. C. Masten. In the late 1880's the Richardsons had three miles of seven foot, two inch gauge.

But the spread between rails was to reach masterful proportions in the Territory of Washington. It started with the pole roads around Puget Sound. As early as 1876, a steam locomotive was reported in Snohomish County which straddled log rails spaced eight feet apart. In 1887, *Poor's Manual of Railroads* revealed that eight-foot gauges were in use on Newskamp's Railroad and on Ulner Stimson's mile and-a-half line. The Olympia & Mt. Rainier measured in at eight feet, one inch, and the Jackson Logging Railroad stretched that another three inches.

What may be the all-time national record for gauge width was claimed by the Washington Mill Co. at Seabeck. Its line was two miles long and nine feet broad—three times wider than narrow gauge.

At the other extreme, W. R. Hawthorne ran his geared locomotive on a 21-inch gauge, probably the narrowest span for any steam logging road.

The compromise gauges presented some difficulties which eventually brought their downfall. It was hard to find used rolling stock to fit special gauges. It was a bother to convert them, and expensive to special-order them. Interchange with other railroads was impossible.

The loggers who wanted to keep their non-standard gauges—for reasons of sentiment, stubbornness or economics—found an answer in the addition of a third rail.

Diamond & Caldor Railway third-railed its yard lines to permit use by its own narrow gauge equipment as well as outside standard gauge cars. Sierra Nevada Wood & Lumber Co. did the same thing in 1907, having five narrow gauge and three standard gauge locomotives on its roster. McKay Lumber Co. and Sierra Lumber Co. struggled along with two different gauges at the same time—both narrower than standard.

Eastern & Western Lumber Co. in 1906 added a third rail in an attempt to harmonize its patched-up railroad system. The confusing result was four miles of standard gauge, six miles of narrow and six more miles of double gauge.

There was no easy solution for Diamond Match Company's California operations around 1910. The 20-mile Kimslew Railroad, serving Diamond's Stirling City mill, used three standard gauge locomotives. The 20-mile line out of its Lyonsville mill used two engines on a three-

foot, two-inch track. And at its Red Bluff mill, four locomotives were operating on 15 miles of three-foot, three and three-quarters-inch track.

After Northern Redwood Lumber Co. had acquired Arcata & Mad River Railroad, the lumber company's logging super was given the chore of coordinating railroad operations of the two companies. Reluctantly, he ordered a third rail laid alongside Northern's standard gauge track to accommodate A & M's three-foot, nine and-a-half-inch gauge. In his monthly report, he confessed to the manager that he had just "bastardized eight miles of perfectly good Northern Lumber Co. track."

While the woods boss was technically correct—bastard gauge was the recognized term for a distance between meter gauge and standard gauge—it was another indication of the contempt loggers had developed for the bothersome special gauges.

Gradually the term "standard gauge" worked its way into the logger's language. It came to mean anything that was acceptable or better. The use of "narrow gauge" to describe such things as the boss, a camp or even a week-end in town, meant that the subject was below the logger's expectation.

BROAD GAUGE tracks set one foot wider apart than today's standard was not considered unusual by Gualala Mill Co. when this line was laid out in the 1870's. It was one of several dozen variations in gauges employed by Western loggers.





THIRD RAIL was commonly laid on curves as protection against derailment. Scene on Milwaukee Lumber Co. line in St. Joe National Forest about 1913.



TUNNEL at Crescent Lake on the Olympic Peninsula was one of the costliest ever built. The bore was driven for 460 feet through solid rock in the Government's hurried effort to obtain spruce for airplane construction during World War I. (Washington State Historical Society)

HOGS, GOATS AND IRON OXEN

To the logging operator, no worldly possession was more important than his locomotive. It was basic to the entire logging-milling complex and received whatever maintenance attention he was inclined to dispense or could afford.

Vital though the locomotive may have been, her busy smoke concealed some mysterious qualities that made her the object of many a love affair. No matter that she looked and sounded like a steel nightmare, was a bad steamer or had to take the grade backwards to prevent a dry boiler explosion. The logging lokey had a personality which made her the prima donna of the woods.

From the beginning, railroad men had endowed their engines with the feminine gender, and the tradition was continued by loggers. The engine was a "she," scissorbills or greenhorns were told, because it wears apron, binder, bonnet, cap, collar, hood, hose, jacket, muffler, petticoat, pumps, sash, shoes, sleeve, wrapper and yoke and eats twice what she's worth.

The logger was able to add another reason. His locomotives were called "she" because like women, they'd rather not admit their age after 20 years.

The chances were excellent that the age of any western logging locomotive picked at random would be well over 20. As one British observer put it, most of the motive power used to haul logs was bought "extremely second-handed."

Some of these jaded camp followers had more than half-a-dozen different masters, who paid successively lesser attention to appearance and maintenance. The average logging locomotive changed hands three times, making ancestry of little concern. Either the locomotive could do the job or it couldn't and records of her sale, exchange, foreclosure or scrapping were a sometime thing.

"Disposition unknown" must be chalked in the final column of the roster sheet for most of the West's logging locomotives.

Typifying the difficulty of tracking down their ownership history is the saga of a durable Baldwin product, built in 1870, which changed hands no less than seven times. Originally Virginia & Truckee Number 10, it came to the end of the line as Chambers Lumber Co. Number 2. City of Prineville Railway's Number 2 steam pot also had seven owners, including Brooks-Scanlon Lumber Co.

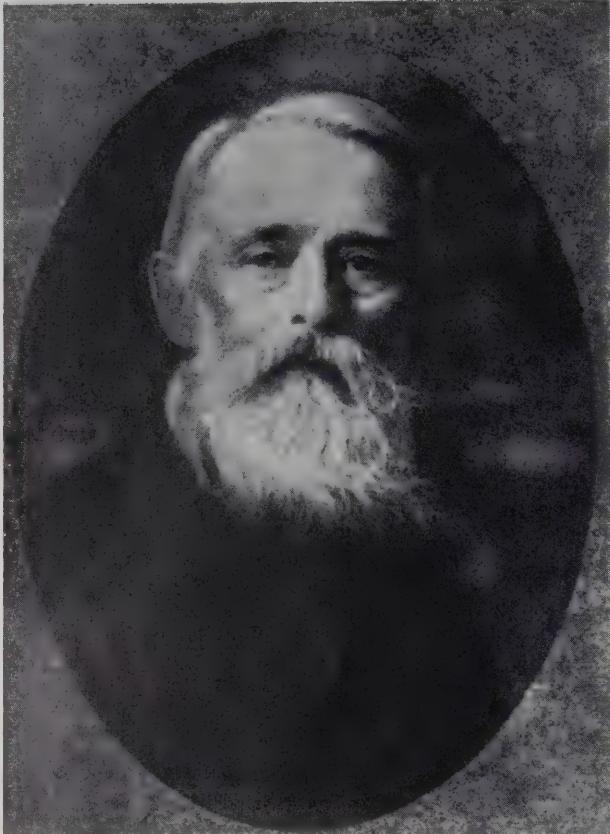
H. H. Martin Lumber Co. in the '20's was still using the "Galloping Goose," a battered wanderer reputed to have had 10 previous owners. "The only original part of this 50-year-old wreck is the nameplate," reported Logger Frank Martin.

While older than most, Martin's patched-up hussy probably typified the logging locomotive. She was a cranky and unsightly hoyden with a deafening voice. Her "bandstand" was usually cluttered with wire rope, lanterns, tools and hose. An ugly, out-sized smoke stack added nothing to her beauty, although it helped cut down on the number of forest fires she caused.

Her driving wheels were smaller than those of her relatives on the mainlines and were usually de-flanged to minimize derailments. Side or saddle tanks were commonly applied to her boiler for greater tractive power.

When new, her 50 tons of steel had cost an average of \$10,000 in 1914, and about double that in the 1920's. Used locomotives cost whatever the operator wanted to pay. In 1900 Sierra Nevada Wood & Lumber Co. paid \$1,500 for the "T. R. Judah," the first locomotive to cross the Sierras. McCormick Lumber Co. in 1917 acquired "Sir Hugh," a pioneer Forney built for International Railway of Canada in an even-up trade for a carload of ties. An eastern Oregon operator came home from a Logging Congress poker-playing session with a 2-6-2 in tow.

She looks like a magnet dragged through the parts shop, was a common description of the woods lokey. The old girl had been around and showed it. Whatever she lacked in beauty was



EPHRAIM SHAY was the enterprising lumberman who revolutionized railroad logging with his lop-sided, geared locomotive. Although a total of 2,761 Shays were built between 1880 and 1945, Shay refused payment beyond the \$10,000 received for his original patents.

more than compensated by her usefulness, in which the logging locomotive had no equal in any other type of engine.

She was the most versatile piece of equipment in the woods, made all the more so by the logger's legendary ingenuity. At one time or another, the locomotive could be found trailing logs along the rails without cars, loading logs onto cars with a "parbuckling" wire rope arrangement and unloading them with a primitive "jillpoke" pressure system. Equipped with a cable and drum outfit on the pilot, the locomotive even acted as its own yarder, dragging logs from where they had been felled to the loading point. All such log-handling activity which is carried on today requires individual pieces of powerful equipment.

To "make her sit up and talk" seemed to be the logger's goal as he applied his locomotive to chores that even the manufacturer hesitated to advertise.

The narrow gauge engines of Lake Tahoe Railway & Navigation Co. were used as prime movers not only for logs but steamships. By the use of a block and tackle rig, the little locomotives were able to haul the heaviest of the lake

excursion steamers out of the water when it was time for repairs.

Goodyear Redwood Co. in the '20's was using a steam hose from the locomotive boiler to activate a piston plunger which pushed logs off the cars into the log pond. The Eufaula Co. borrowed locomotive steam to run its car-mounted loading engines.

Manufacturers of the Norby track layer boasted that their machine was economical because it utilized steam from the locomotive. The same source commonly supplied heat for the crummys that carried woods crews to and from work.

A happy woods foreman employed by Standard Box & Lumber Co. reported in 1916 that locomotive steam had been successfully applied to camp bunkhouses to rid them of lice, bedbugs and assorted insect-life. "That steam seems to get them coming and going," he beamed.

Boiler steam was used to operate pumps during road construction work and to generate emergency electricity for the mill and nearby settlements.

Fortunate employees of Smith-Powers Logging Co. had hot water each morning, thanks to periodic deposits from the locomotive tanks made in barrels alongside the tracks.

Boise-Payette Lumber Co. used locomotive power to drag sunken logs out of the mill pond. McCloud River Lumber Co. used boiler steam blown on the rails to get rid of hordes of caterpillars which seasonally stopped their log trains.

But good old "Daisy," "Bertha" or "Maggie" is best remembered for those occasions when her versatility made her a heroine of sorts. Often it was when she was used to pump water from a creek to put out a forest fire. Her air pumps might have been used to operate pneumatic tools on emergency repair work away from the shops. Her steam may have powered hydraulic pumps in clearing away the muck and rubble of slides. Or perhaps she had saved the lumber mill from fire by pumping water from the log pond.

The little narrow gauge dinkey of Loma Prieta Lumber Co. was given an ignominous part-time job that would make more prideful logging operators hang their heads. In summer months, she was rented out to the nearby Santa Cruz Beach Railroad and used to haul vacationing fun-seekers along the shore.

Many of the log-hauling locomotives were given names as well as road numbers. As might be expected, women's names were prominent on the roster. There was "Belle," "Tollie," "Peggy,"

"Betsy Jane," "Molly-O," "Old Huldah," and "Pansy," among others.

Some loggers attempted to add dignity to their operation by applying locomotive names such as "Defender," "Advance," "Hercules," "Excelsior" and "Trojan." What names their crews and logger passengers called the grandly named vehicles is not recorded, but it may reasonably be assumed that the impressive titles were not widely used in the woods.

As in the naming of racehorses, there was honor attached to having one's name bestowed on a locomotive. A few operators presumed to name their iron horses after themselves, but more often, personal names were those of friends, relatives or financial backers.

Place names provided a popular source of locomotive titles, as did the Indian influence. "Siwash" and "Skookum," "Santa Cruz" and "Mexico" reflected the wide geographical sweep of the western logging lines.

The operators were not impressing anyone with fancy names. The logging locomotive was usually a rolling junkpile, and a name like "Greyhound" or "Onward" added little to the efficiency of the operation.

A refreshing realism gradually crept into the practice of naming locomotives as "Old Blue," "Gypsy" and "The Coffee Pot" steamed into the logging camps.

To the everlasting credit of the logging railroad operators, the roster of official names also includes "The Jackrabbit," "Cyclone," "Blizzard," "Coffee Grinder," "The Ant," "The Grasshopper," "The Rattler" and "The Chippy."

Invoking the magic name of an influential politico of the day brought no good fortune to Sierra Flume & Lumber Co. in 1881. Its Number I locomotive, bearing the name of a California capitalist on its sides, was delivered to the Lyonsville camp by horse and wagon. Union Iron Works of San Francisco had incorporated the latest refinements in its product, in keeping with the elegance of the new locomotive's namesake.

At the end of the logging season, the manager of Sierra had brought Union Iron Works to court. He claimed that Union was guilty of manufacturing a shoddy product. The engine was so inefficient, he charged, that the operation lost money. This insult to the great man of the day whose name appeared on the locomotive was avenged by a local court, who agreed with the lumber company.

The decision against Union Iron Works was

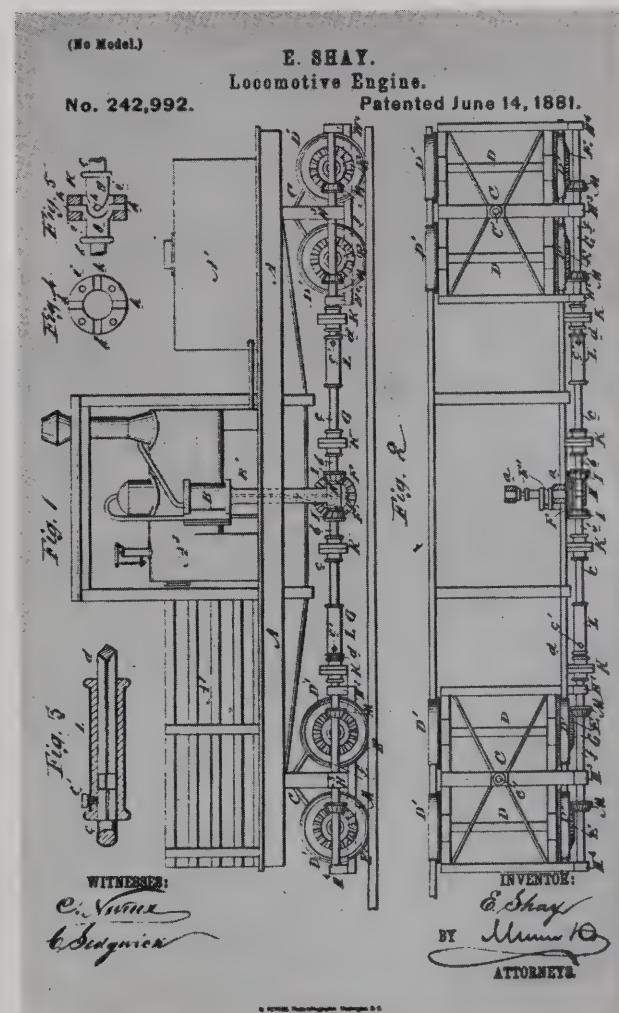
later reversed by the Tehama County appellate court, but the incident was significant: the steam engines of the day were not keeping pace with the increasing demands of logging work.

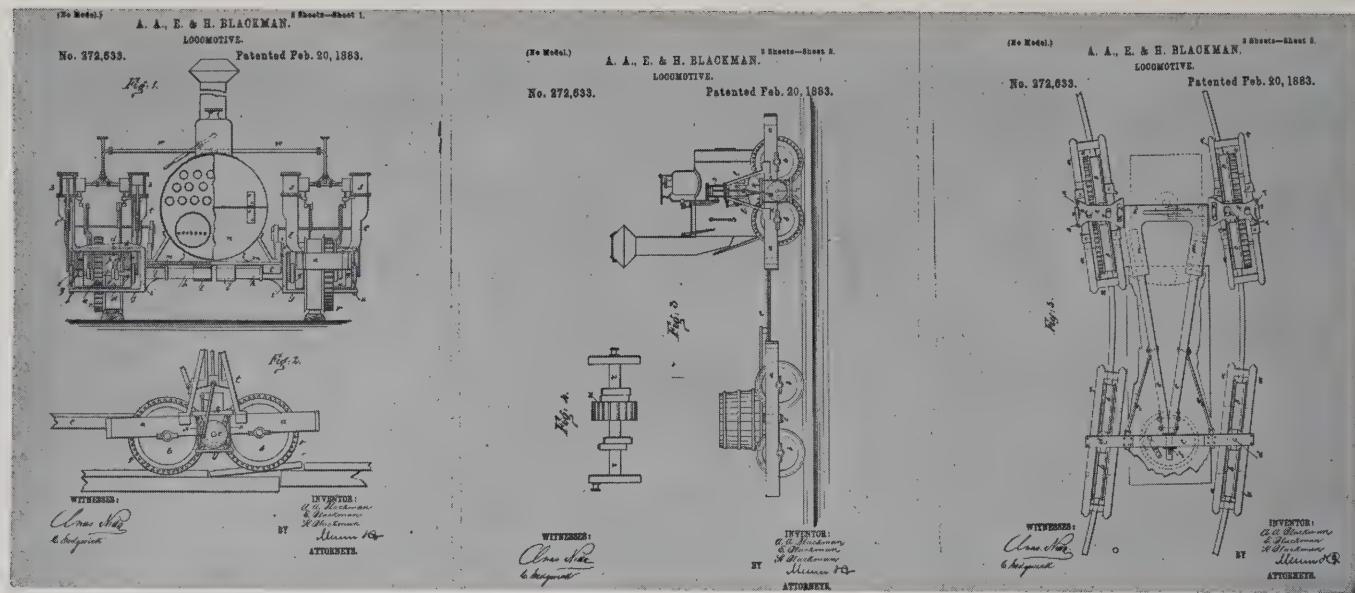
While the logging operator was able to make intensive and lasting use of the Consolidations, Moguls, Pacifics and several dozen other breeds of rod-type locomotives purchased second-hand from the mainline railroads, he found them lacking a number of qualities needed for severe spur line service.

One who had observed the shortcomings at first hand was Ephraim E. Shay, a rugged, broad-shouldered logger of Haring, Michigan.

"Business was dull in the 1870's," Shay related, "and I was compelled to reduce logging costs or quit. Logging cost \$3.50 per thousand board feet from stump to mill, using horses and logging wheels."

SHAY'S PATENT in 1881 shows basic simplicity of the side-shaft geared locomotive. Only one cylinder was used in this early version. Two-cylinder models were made from 1881 to 1884, and three-cylinders were standard thereafter.





BLACKMANS' LOCOMOTIVE was the second major effort to apply geared power to logging. The Blackman brothers had unusual mechanical ability and developed their locomotive without having seen a Shay or any other geared type.

Shay built a maple-railed tramway, using horses for power, and reduced his costs to \$1.25 per thousand. "But the cars would catch the horses on down grade and sometimes kill them. Brakes were impractical. I finally concluded to try a light locomotive, and with the help of a local repair shop, did so."

Shay's first engine, while lighter, was built along conventional lines, and the pounding of its rods soon tore up the wooden rails. Surprisingly, the loaded log cars weighed twice as much as the locomotive, but did no damage to the tracks.

Shay reasoned that if he could relay power to trucks similar to the log car wheels, the track-punishing effect of rod drivers could be eliminated.

While snow covered the Michigan woods during the winter of 1872, the bearded tinkerer worked on the idea in his home workshop. The following spring and for subsequent seasons, Shay alternately used his geared engine and improved it. By 1879, only the cylinder remained of his original locomotive.

"All of this work was done by me and my lumber mill blacksmith," Shay revealed, "and was crude in the extreme. But it drew logs from anywhere and all places, saving much labor from teams and was extremely profitable."

"My friends remonstrated with me for spending so much time and money on such a crazy idea, and in fact, they really thought I was a little cracked, and did not hesitate to say so."

But Shay was to revolutionize the business of logging. His geared locomotive and the competing types it inspired made efficient log-haul-

ing possible in forests where rod locomotives could not venture.

Messrs. Carnes and Agerter of the Lima Machine Works had been watching Shay's experiment with interest. They had built a couple of locomotives themselves, and in the late '70's had produced a few parts for what the local loggers were calling "Shay's Folly." Yet even the alert proprietors of the Lima concern were shocked when they first viewed the rolling monstrosity that Shay was now suggesting that they manufacture in quantity.

The pilot model of the locomotive that was destined to become respected around the world consisted of a short railroad flatcar with a wooden water tank at one end, a wood bin at the other and an unsightly assortment of machinery surrounding an upright boiler in between. What's more, the thing was lopsided, with the boiler on one side, and geared transmission machinery on the other.

"One consoling feature," Shay later wrote, "was that I was making more money from its use and I could get more for my timber than my neighbor mill men. My customers knew that rain, bad roads, etc., did not deter me from logging."

The logic was evident to the proprietors of the Lima works and in 1880, the first factory-built Shay geared engine was sold to J. Alley Co. for \$1,700. Three Shays were built that year.

Until 1885, all Shays were two-truck types, with geared power transmitted to the four driving wheels on each truck. A three-truck model was then added to the line and the upright boiler

was modified to a boot shape with flues running through the horizontal part which faced the rear.

The Shays were still limited to less than 20 tons in weight—just about heavy enough to mash a finger, scoffed the supporters of rod locomotives.

There were nearly 200 stemwinders snorting around the eastern woods in 1888 when Climax Manufacturing Co. of Corry, Pennsylvania, sold its first geared locomotive and ended Lima's monopoly. The endless argument over which was the best geared engine was now under way.

The earliest Climaxes were similar in appearance to the Shays, except that the cylinders and driving machinery were centered. Later models looked more like a conventional rod locomotive. On each side of the boiler was a cylinder mounted parallel with the track, but inclined toward the ground at about a 45 degree angle. The pistons drove a crankshaft running crosswise under the boiler. Through a master gear, power was transmitted to a longitudinal center shaft and through bevel gearing to the wheels.

For more than a decade, double-flanged wheels and corrugated wheels were offered as optional equipment in an overture to loggers using wooden rails and pole roads.

The Climax was a cheaper product, but the Shay's head start put it well on the way to becoming the Model T of the woods. By 1893, the 450th Shay was outshopped and placed on dis-

play at the World's Columbian Exposition. Before the gates to the fair grounds closed for the last time, another competitor for the geared locomotive market was born.

Charles Heisler's first locomotive was produced at Erie, Pennsylvania, and sold in 1894. It could not claim any improvement in looks over the Shay, but as a Heisler advertisement of the day pointed out, "the load is equally distributed on the main frame instead of one-sided." Heisler had hit the Shay at its most vulnerable point—the Lima product pounded the daylights out of the cylinder-side rail, leaving the boiler side of the tracks little-touched.

The two-cylindered Heisler had a pair of pistons opposed in the form of a "V" located at each side of the boiler. Unlike the Shay and Climax, its gears ran in oil within sealed housings. The number of gears was reduced by having only one axle in each truck geared to the main driveshaft, with power transmitted to the other axle through side rods connecting the two pairs of wheels. A Heisler could start off on a 10 per cent grade with a load of 111 tons.

With the entry of the Heisler, essentially all the participants had lined up for a 50 year race for the logger's favor. The locomotive manufacturers now began a bitter struggle for the lucrative new market which their products had made possible.

In an obvious attempt to blacken the eye of Shay's reputation, the Porter works advertised that "our locomotive looks you straight in the



"OLD BLUE" of Pokegama Sugar Pine Lumber Co. proved to be a disappointment in 1897 after being hauled 30 miles up the Cascades by freight team. Not powerful enough for log-hauling duties, she was used only to take empty cars back to the woods. Loaded cars were routed to the Klamath River log chute by gravity.

eye." Davenports were billed as the ideal logging locomotive for all conditions. Baldwin claimed the best of everything for its rod engines, while American modestly pointed to dependable haulage. Vulcans, it was said, offered the logger "an elegant opportunity."

"Per ton of locomotive, the Climax will haul the greatest number of cars of logs on steep grades," continued the argument. It was a feature claimed at one time or another by five different manufacturers.

A major skirmish of the war was fought out at Portland's Lewis and Clark Exposition in 1905. The gold medal for excellence was awarded with much fanfare to a Baldwin locomotive. Representatives of the rival Lima Locomotive & Machine Co. were furious, charging among other things that the chairman of the jury was a harness-maker.

Harrassed Exposition officials let Baldwin keep its gold medal, but appointed another set

of judges which thoughtfully included several Shay supporters. The result was the award of a gold medal, superior jury, to the Shay.

No matter what the claims and counter-claims of the manufacturers, it was performance that interested the logging operator. Numerous improvements to the locomotives—both geared and rod—were made over the years to keep pace with logging operations that pushed back into increasingly difficult terrain.

The manufacturers of rod locomotives had moved the water tank up from the tender to tanks beside or over the boiler. These side or saddle tanks provided added weight above the driving wheels. Driving wheel diameter being a factor in tractive power, the size was lessened to meet the demands of logging work.

Typical of the improvements was Baldwin's Sequoia type. Among other advantages, it had 25 per cent more heating surface than earlier models. Its first users, Polson Logging Co.,





CLIMAX LOCOMOTIVE had a pile-driving action that earned it a reputation as a bucking brute. As Yeon & Pelton's 1902 model shows, it had less moving parts than a Shay and was easier to maintain. (Oregon Historical Society)

Weyerhaeuser Timber Co. and Peninsular Railroad Co., found that it could handle 6 per cent grades and 36 degree curves.

The Shay, by means of a series of universal joints in its underpinnings, could still best its competitors in curve-taking. It could snake around a curve so sharp, went the rumor, that its headlight would shine over the engineer's shoulder into the firebox.

In an attempt to keep both sales and product on the track, Baldwin adapted the articulated and articulated compound locomotives for log-hauling. The principles were combined in the Mallet, which had two sets of driving wheels. High pressure steam to power the rear set and low pressure for the front came from the same boiler. The leading set of frames, cylinders and driving wheels was independently mounted, supporting the front of the boiler by a pivotal arrangement. This effectively reduced the rigid wheelbase, but gave the articulateds the illusion of going in two directions at once while rounding a curve.

A 61-ton Mallet acquired by Caspar Lumber Co. in 1909 became the first to be used in logging anywhere. It was so powerful, volunteered an observer, that it could haul in one train the entire annual log output, the annual mill output, and a whole week's supply of beans for the camp.

Booth-Kelly Lumber Co., Whitney Co. and Columbia River Belt Line Railway bought new articulated compound wood burners in 1910, and the Mallet's reputation as a log-hauler was soon established. Baldwin's advertisements had proved accurate when they described Anatole Mallet's innovation as powerful, flexible and easy on the track.

Baldwin turned out a pair of narrow gauge Mallets for Uintah Railway of Utah which later spent a good many years hauling logs and lumber on the Sumpter Valley Railroad, an associated company. They were the only narrow-gaugers to be used in this country.

The Mallets focused the logger's attention on the benefits of increased power.

The one-horse Shay was all right in its time, quipped the editor of *West Coast Lumberman* in 1910, but nothing less than a forty-horse Shay goes now.

The Lima works had souped up its product with a third cylinder in 1884, and during the first decade of the new century, came out with heavier, more powerful models reaching the 150-ton class. These were four-truck Shays with a total of 16 driving wheels. But the end of the line was near for the Shay patents. The rights to produce Shay's "rolling corkscrew," for which Carnes and Agerter had paid \$10,000 in 1880, had expired in 1922 when Willamette Iron & Steel Works of Portland began production on an undisguised copy called the Willamette Shay.

The Oregon product was inferior to the original Shay and required extensive re-shopping. Only 33 geared locomotives were sold by Willamette before it gave up the business seven years later. But the threat of competition had goaded the Lima people to action.

The first "improved" Lima Shay was unveiled at the Pacific Logging Congress of 1927. Except for being a foot longer, there was little difference in outward appearance over the Shays that had been in the woods for decades. Lima had enlarged the firebox and grate and added superheaters among a number of other minor changes. The new 70-ton model had about 25 per cent more tractive power. With an eye to their potential market, the Lima people had named it the Pacific Coast Shay.

MIKADO TYPE locomotive was popular as a main line log-hauler because of its power and excellent tracking qualities. Number 1 of Weyerhaeuser's Klamath Falls operation was a 70-ton Baldwin built in 1912 for Twin Falls Logging Co.

As the West's logging railroad mileage neared its peak, other locomotive manufacturers joined the battle.

Heisler in 1928 brought out its "West Coast Special." It was "guaranteed to show more power than any other locomotive—and faster!"

Porter tried to steam up enthusiasm among loggers for its fireless locomotive in the '20's. The clean-looking unit did not generate its own steam, but borrowed it from lumber mill boilers or a similar stationary source. Even though it reduced fire hazards in the woods, the loggers shunned it after The Pacific Lumber Co. found a pilot model to be inefficient.

Davenport jumped into the fray with its own version of a geared locomotive in 1924. The first railroad steam engine in America had been a geared model, and nearly a hundred years later, Davenport attempted to use the principle to bolster its lagging sales of rod locomotives. Its Forney-type unit had driving gears housed in oil, as well as a two-speed gear shift arrangement. It became the eighth important effort to produce the ideal geared locomotive.

The geared Davenport was a flop, as were many predecessors which attempted to make railroad logging easier or cheaper.

Even the venerable Baldwin Locomotive Works headed for the geared engine market and failed to make the grade. Between 1912 and 1915, Baldwin produced five of its two- and three-truck geared locomotives, which were similar in appearance and operation to the





LOG DUMP of Storey-Keeler Lumber Co. featured a canted track which aided removal of logs from cars. Wood-burning locomotive is a Climax Class A. (Oregon Historical Society)

Climax. The only one which found its way West was bought in 1913 by Montesano & Northern Railroad.

Another well-financed venture was the geared entry of Brooks Locomotive Co., through its short-lived subsidiary, Dunkirk Engineering Works. Their Gilbert-designed locomotive was a cross between an early Climax and a Heisler. Less than half a hundred were produced between 1890 and 1894, of which only two were sold new to western logging outfits.

Another promising geared locomotive patented by Oscar Hopkins of Idaho never saw production.

While Shay had been putting the finishing touches on his contraption in the late '70's, other tinkerers located 2,000 miles away were performing remarkably similar experiments.

As early as 1875, the Blackman brothers had toyed with the idea of a "steam car" to haul logs to their Marysville, Washington, mill. Like Shay's first model, it turned out to be a flatcar converted to a locomotive by the addition of a vertical boiler, water and fuel storage and geared wheels. The Blackman version ran on wooden rails spaced seven and-a-half feet apart.

It wasn't until early 1882 that the word of Shay's engine reached the woods of Puget Sound. The Blackmans hurriedly applied for a patent on their geared model in August of that year—14 months later than Shay received his patent. There's no question that Shay's vertical cylinder was superior to the Blackmans' clumsy cog-wheel arrangement, but the Shay wasn't introduced to the West for many years. The Blackmans produced 30 geared steam cars be-

fore the arrival of the Shay and other improvements made them obsolescent.

The innovators never ceased. T. W. Garbutt of Georgia believed that he had the answer in 1898. It was a "very simple locomotive that could be readily handled by the men in the logging camps." An eye-catching feature of his product was a pair of cylinders that swung back and forth like pendulums.

Two years earlier, Barney & Smith Car Co. of Ohio brought out the first "convertible" in the timber industry. Looking more like a monstrous hay-mowing machine than a locomotive, the 30-horsepower behemoth could be run on a pole road, iron track or bare ground. Despite the fact that the versatile engine could also be used to power a small sawmill, the "Steam Missionary" as it was called, never made a convert.

Several western logging operators welded standard rod locomotives back to back in an attempt to obtain twice the power from one unit. The double-breasted engines were handy on a track system without wyes or turntables, but eventually proved to be more nuisance than they were worth.

The all-time championship for the most outlandish machine in the woods is claimed indisputably by the Fouts Grip Wheel. Like the Walking Dudley which preceded it by a few years, the Grip Wheel employed a vertical steam engine mounted on a flat car. By means of a huge wheel, the monster winched itself along a cable anchored at either end of the tracks. Henry Colvin of Oregon was the first to use a

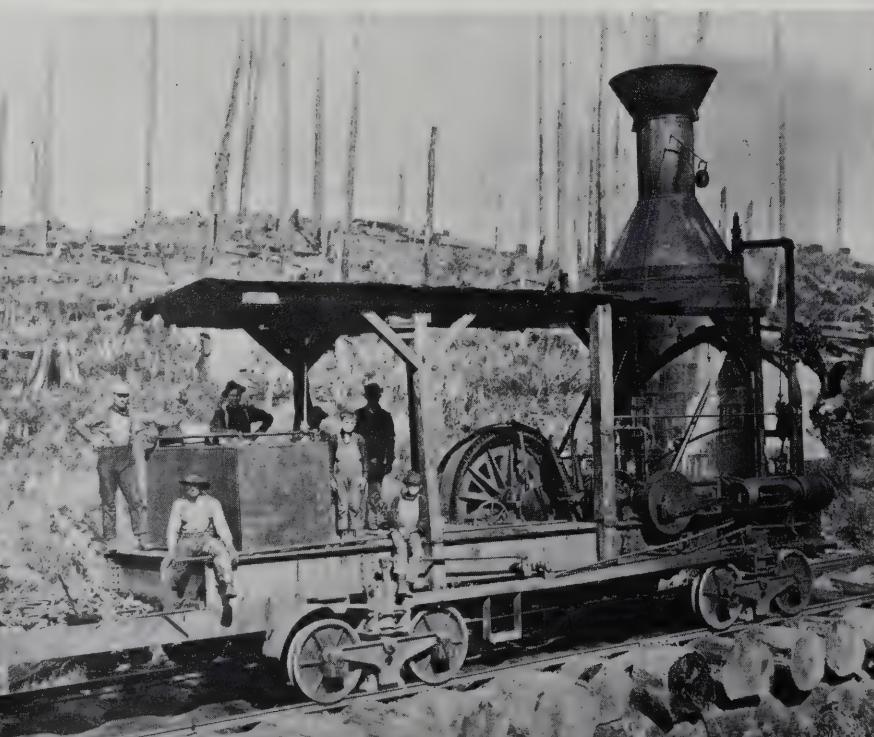
Fouts in 1898 and successfully trailed logs behind it at a grade of 28 per cent.

A year earlier, a disillusioned Simpson Logging Co. had converted the last of its six Dudleys back to a flat car.

J. H. Dotterer of Ostrander, Washington, came up with a workable logging locomotive in 1934 that had two sets of driving wheels pivotally mounted to each end of the frame. It was similar to a 50-ton model that Vulcan Iron Works had first offered to loggers in 1931. But the early '30's was no time for such ventures. More than half the Nation's lumber mills were shut down and logging railroads were on the decline.

American Locomotive Co. made a late attempt to keep the rod locomotive in the woods. In 1923 it began production of a Mikado-type unit with four sets of driving wheels. The 2-8-2 was the most powerful single-expansion, two-cylinder, saddle-tank locomotive ever built. Weighing in at 130 tons, the trim American could take 28 degree curves and 8 per cent grades. In honor of Sugar Pine Lumber Company's Minarets & Western Railroad, which bought the first 10 models, it was called the Minarets type.

No one had ever seriously disputed the superiority of geared versus rod locomotives for strenuous woods duties. The rock crushers, so-called because their exhaust came four times faster and louder than rod models, were slow but powerful. An incidental advantage was that in their slowness they were less inclined to be involved in serious accidents.



FOUTS GRIP WHEEL locomotive was the most awesome piece of machinery in the woods. Like the earlier "Walking Dudley," it winched itself along a cable, trailing logs behind. This double-flanged wheel model was used by Henry Colvin at Marshland in 1899, where it negotiated a 28 per cent grade.



GEARED MONSTER was developed by the Blackman brothers in 1881. It was reputedly the first locomotive built in Washington Territory and the first to be used in Snohomish County. Its gauge was seven and-a-half feet. Other Blackman models required wooden rails spaced up to nine feet apart.

The Shays, Heislers and Climaxes had a steadier pull than the rod models, derailed less frequently, and because of their more uniform exhaust, steamed more freely and consumed less fuel. Geared engines were as much as 11 per cent quicker and more accurate in spotting cars and took about 20 per cent less time in attaining a speed of 10 or 15 miles an hour. They were able to negotiate sharp curves, rough roadbeds and light rails. For a clincher, the cost of operating a geared locomotive was around \$18 per hour, compared with \$22 an hour for a saddle-tank rod model.

While all concerned agreed that the noisy, gear-driven engines were superior to direct-connected ones for most woods chores, the argument over which was the best geared locomotive has never ended. For more than half a century, the subject has endured as conversational material among partisans in the Tacoma Clubs, the Erickson's Saloons and camp bunkhouses.

The Climax had a simple design, some said, but was the least efficient, said others. The Heisler was poorly built but there was no power loss through the gears, went the commentary. The Shay's gears, being exposed, were more subject to damage, but easier to reach for repairs, continued the argument.

The operators backed up their opinions with cash. Simon Benson bought seven new Shays at once in 1901. West Side Flume & Lumber Co.

a year later bought three new Heislers, making a total of five on their roster. Mutual Lumber Co. bought seven Climaxes in as many years.

White River Lumber Co., El Dorado Lumber Co. and Weyerhaeuser Timber Co. were among the undecided ones. Each was using a mixed bag of all three makes of geared locomotives at the same time.

The Climax works folded in 1928, with a production record of just under 1,000 locomotives in 40 years. Its last 70- and 80-ton models were delivered to McGoldrick Lumber Co.

The highball days were just a memory to the Heisler Locomotive Works when it outshopped its last locomotive in 1945.

The argument over which was the best geared locomotive had been won decisively by the Shay. When the last stem-winder left the Lima works in 1945, it represented the 2,761st vote of confidence in "Shay's folly." Climax, Heisler, Baldwin, Davenport and a dozen other manufacturers had tried to improve on the bearded logger's product, but never came close.

There were other innovators who felt that steam could be replaced as a power source by something cheaper, handier or more efficient.

"Within a few years," the editor of *The Timberman* told his readers in 1920, "the electrically operated logging railroad will not be uncommon." In its favor he cited the elimination of the fire risk and freedom from the water supply



WEST COAST SPECIAL was Heisler's answer to the Pacific Coast Shay, the Willamette Shay and other improved types that came along in the 1920's. The first of the new Class 90's was delivered to West Fork Logging Co. in 1928. The 90-ton Heisler outlived its producer by more than a decade before it was scrapped in the late '50's.

problem. Fourteen years later, the electric logging railroad mileage totaled a mere 17 miles, but the editor was still optimistic.

"The electrification of logging railroads will be stimulated by the development of cheap power at the Grand Coulee and Bonneville dams on the Columbia River," he insisted.

Puyallup Valley Lumber Co. tried one of the juice jobs as early as 1906, but soon traded it in for a Climax. Western Lumber of Montana had similar misfortune with a new one bought to haul logs in 1912.

A large network of electrified lines crept over the Willamette Valley of Oregon between 1905 and 1920. While these flatland roads carried mostly logs, they were controlled by utility companies or mainline public carriers. Up in the hills the electric locomotive had proved to be underpowered for most logging work. In addition, it lacked variable speeds and required a large source of handy power.

The die-hard defender of the electric logging railroad was Red River Lumber Co. After taking delivery of a new electric locomotive in 1926, it kept electrics rolling for 20 years on its 17-mile Red River Railroad. The loyalty was inspired by the availability of cheap power from nearby power stations.

After 40 years of experimentation in the western woods, it became clear that electric locomotives had only one distinct advantage: a savvy engineer could provide hot coffee to the crew from electric urns hooked up to his power plant.

Try kerosene locomotives, Westminster Iron Works advised in 1920, and discover "a solution to your logging problems." The 7,000-pound dinkey they advertised could be used either on rail or poles.

Converting Fordson farm tractors to pole road locomotives was a big business for Skagit Steel & Iron Works in the '20's. A fad for con-

verted truck locomotives hit central Oregon at the same time when at least a half-dozen loggers tried rail-borne gasoline trucks. Cameron Lumber Co. welded two Whites back to back so that in the absence of a loop or turntable, the "engineer" need only switch seats and crank up the other motor to run his log train in the opposite direction.

Heisler was running third in the race for the geared logging locomotive market when it brought out its Diesel electric in the late '20's. The 60- and 80-ton models were supposed to combine the pulling power of steam geared engines with the economy of oil, but only a few hybrids were sold before the Depression brought production to an end.

Plymouth Locomotive Works sighted in on the loggers when it offered its first Diesel-powered, gear-driven unit in 1927. With four cylinders and 77-horsepower, it had four forward and four reverse gears. It found favor as a low-cost, light-duty locomotive, and a few of them remain in use today as switchers and mill hogs.

Plymouth also came out with a gasoline-powered logging locomotive at the same time.

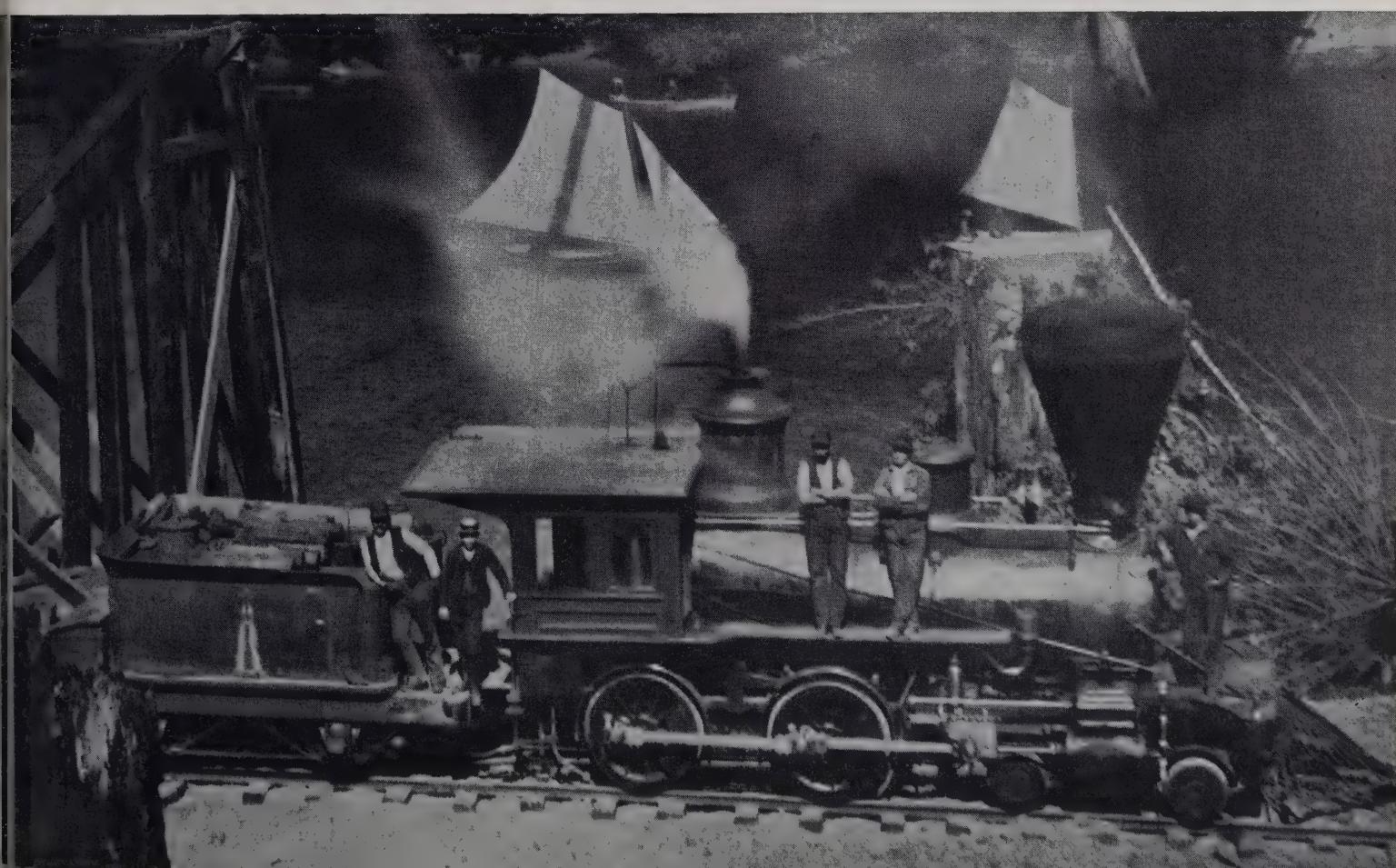
E. C. Olson was the first to try them out at his Idaho operation in 1927, and reported that his pair of narrow gauge models, unlike steam locomotives, were always ready to go. A major economy was the need for only a two-man crew. Madera Sugar Pine Co. bought a 20-ton model for track-laying.

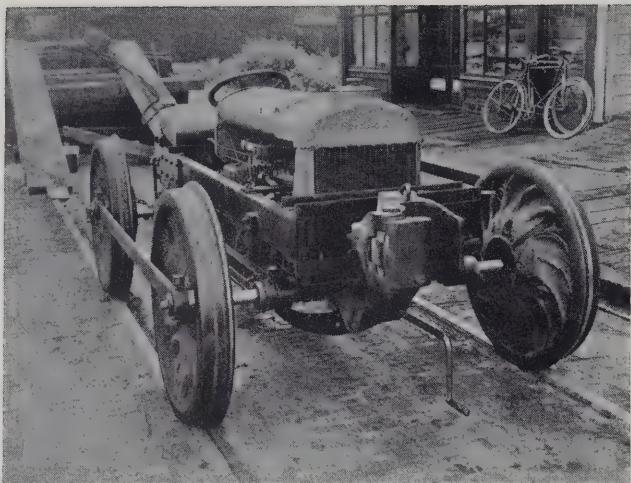
The gas jobs were "as handy as a pocket in a logger's shirt," testified Merrill & Ring's woods boss, who pointed out that any logger could learn to drive one in a few hours.

Wilson & Olson in southwestern Washington were among the first to try a gasoline locomotive in 1902. Hobart Estate Co. found their 1908 Milwaukee three and-a-half ton model so successful that they bought a second in 1910. Fourteen years later, Hobart added a Milwaukee six-tonner which proved hefty enough to push through the High Sierra snows.

"There is undoubtedly a coming larger use for gasoline locomotives in logging and lumber operations," spoke the inevitable prophet for any innovation in motive power. In this case it was the logging superintendent of Cady Lumber Corp., whose 1928 prediction never came true.

AMERICAN TYPE locomotives with four driving wheels were the most widely used model in the western woods during the last century. The 4-4-0 above was made for Gualala River Railroad in 1881 by Union Iron Works of San Francisco.





CONVERTED TRACTOR locomotive found brief popularity for light log-hauling duties in the 1920's. As more powerful Diesel locomotives became available, the flange-wheeled Fordsons and Holts were returned to the farm.



The use of gasoline-powered logging locomotives was at its peak at the time, with a couple of dozen loggers listed among the 300 users on the Pacific Coast.

When Red River Lumber Co. added the first Diesel locomotive west of Chicago in 1926, most of the industry's prophets were cautious. "Loggers are watching its performance with interest," ventured *The Timberman*.

A year later, Ira Withrow of Polk Operating Co. was saying that "there is no question that the Diesel is the coming power in the woods. It saves the expense of water, reduces the fire hazard and the fuel cost is much less than wood."

He had summed up neatly the major reasons why Diesel was to gradually replace steam in the next 20 years. Cold economic facts were closing in on the steam engine.

The Interstate Commerce Commission estimated in the '20's that fuel costs amounted to about 40 per cent of all operating costs on common carriers. On logging railroads, the percentage was probably higher.

The earliest logging locomotives had been wood-burners, with obvious economic advantages to the timberman. Labor in getting wood to the locomotives was a major cost item, however. It took an average of nearly four cords of wood each day, for example, to keep steam up in the locomotive of Eel River & Eureka Railroad in the '80's. Fireboys on Sumpter Valley Railroad chucked as much as five cords into the firebox on a one-way run of less than 100 miles.

After dumping their logs, trains returning to the woods often carried the next day's fuel supply of slabs from the mill piled high on the log cars.

"On steep grades, firemen threw in wood so fast it popped right out through the stacks," according to Old-timer Dave James, "and sometimes stunned grazing cattle a hundred feet away."

Coal was available in many parts of the West but found limited popularity in logging engines. Several lumber outfits in the coal country of Oregon and Washington maintained company-owned mines to feed their hungry charges.

There was some doubt for Kent Lumber Co. in 1921. With only three locomotives, it fueled one with wood, one with oil and one with coal. The opportunity to compare the relative merits of each source of power was equalled only by Bloedel-Donovan Lumber Mills, which at the same time was using oil, coal, wood and gasoline.

Heisler's new three-truck locomotive came out in 1912, suitable either for coal, coke, oil or wood.

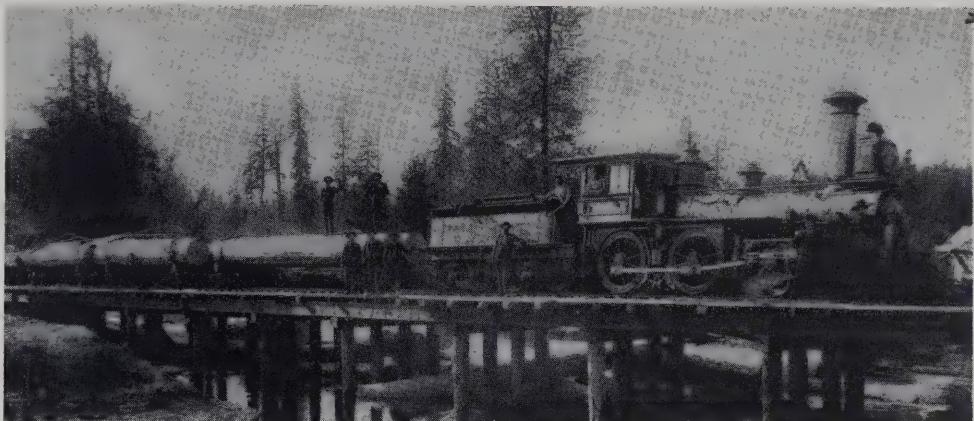
A few operators tried coal briquettes. Home-made charcoal briquettes were used by Wallace Lumber & Manufacturing Co. to keep its pair of geared locomotives going for years. For them, the briquettes had the same advantages which would later appeal to the backyard barbecue cook: steady heat with no sparks and little smoke.

But all factors considered, petroleum was still the West's prime fuel. And it caused fewer fires in the woods. Southern Pacific placed its first oil-burning locomotive in service in 1895. Union Lumber Company's California Western made the switch from wood-burners in 1906, and in 1908 the innovation had reached Union Timber Co. at Grays Harbor.

Consuming about a barrel of fuel an hour, oil-burners had almost taken over by 1930, although a few wood-eaters were belching sparks around the landscape into the '40's.

The Baldwin Locomotive Works observed its centennial in 1931 amidst general gloom in both the timber and locomotive industries. By then the Climaxes, Heislers and Shays were beginning to show that they were not geared for the new age of logging. Depression, Diesel and trucks took their toll. Railroad logging was changing, with tractors and trucks usurping many of the duties of spurline locomotives.

Such locomotives as the manufacturers were able to sell were rod types for main line log hauls. In 1934, the largest locomotive ever used in logging was delivered to Weyerhaeuser Company's Longview operation. It was a Baldwin 2-8-8-2 super-heated Mallet of 175 tons. Not a Shay, Climax or Heisler was built that year. Within a few years, even Weyerhaeuser's custom-built giant would become a rolling white elephant.



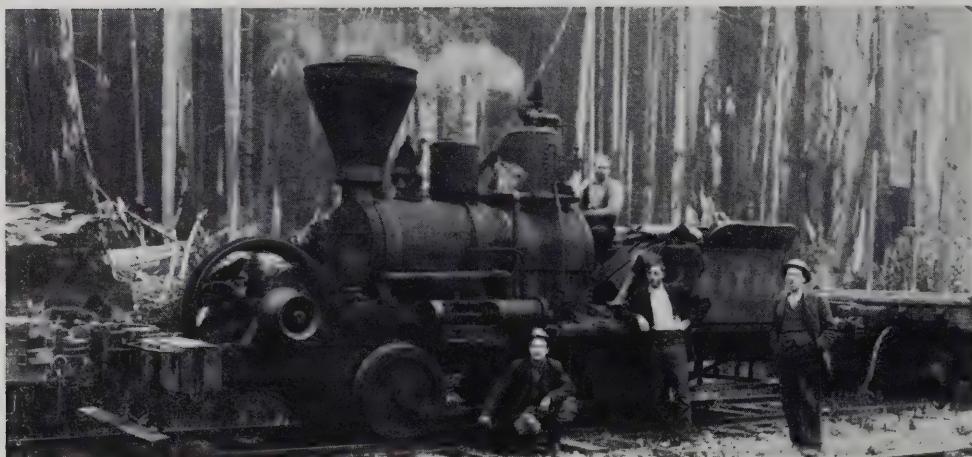
(California Historical Society)

BALDWIN mainline passenger type locomotives of the Seventies were frequently found on log-hauling roads. (Top) Standard-gauge giant which wound up on Mason County Central Railroad in 1886. (Center) Smaller version used by Russian River Land & Lumber Company's narrow gauge North Pacific Coast Railroad in 1875. (Bottom) Narrow-gauge miniature bought new by Carson-Tahoe Lumber & Fluming Co. in 1875 and transferred to Truckee Lumber Company's Lake Tahoe Railway & Transportation Co. in 1899. It is now on display at the Nevada State Museum.





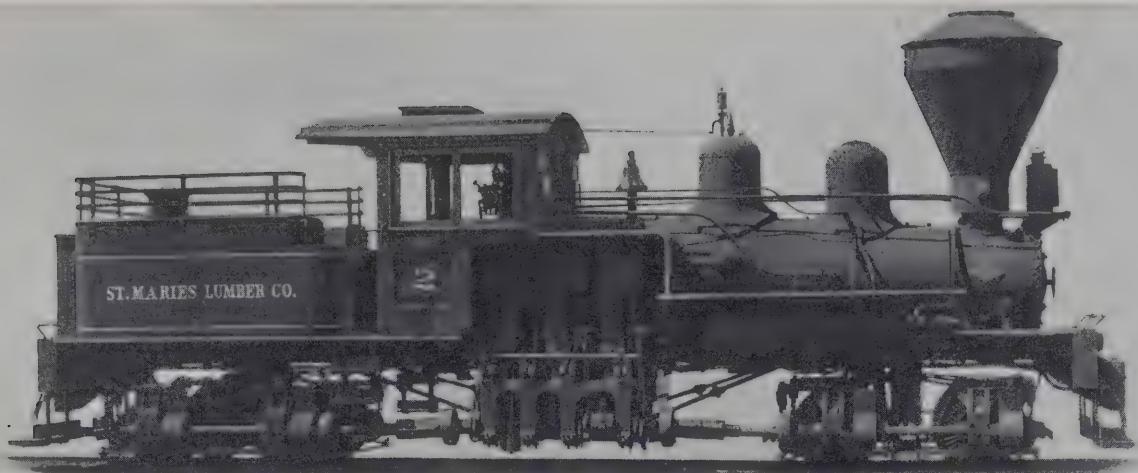
(California Redwood Association)



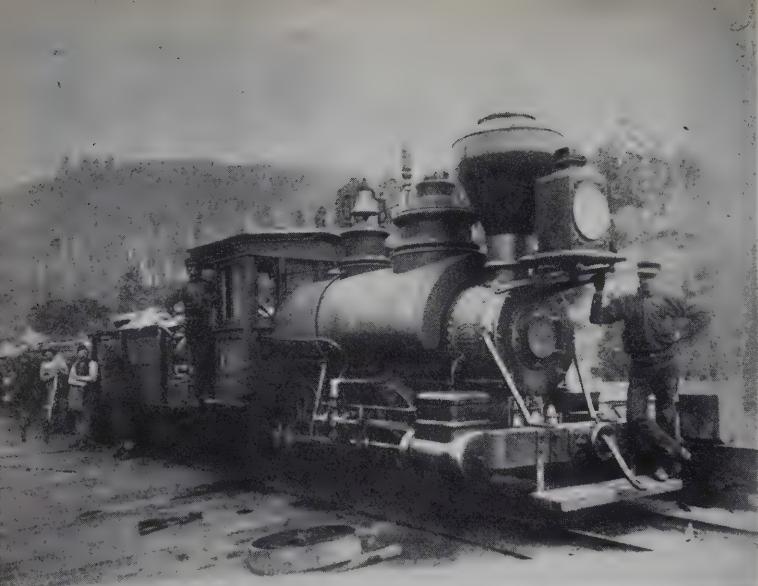
(Forest History Society)

THE GYPSY locomotive was a logical outgrowth of John Dolbeer's donkey engine. The portable log-handling engine was first placed on a locomotive in 1883, with one steam boiler serving both functions. (Top) Gypsy on Dolbeer & Carson Lumber Co. line in the 1880's. (Center) Number 2 locomotive of Oregon & Eureka Railroad at Vances in 1911. (Bottom) Luxury model with wooden cab used on a redwood fire salvage operation in the 1890's.





SHAY LOCOMOTIVES assumed many faces. This quartette of builder's photos shows models outshopped by Lima Locomotive Works within a few months of each other in 1920-21. Top to bottom: two-truck wood-burner of 32 tons; three-truck wood-burner of 67 tons; three-truck oil-burner of 83-ton; three-truck oil-burner of 100 tons.



SADDLE TANKS which carried water over the locomotive boiler not only dispensed with the water tender but provided welcome weight over the driving wheeels.

(Top left) Earliest type of tanker was this Baldwin of mid-'70's vintage used on Mendocino Railroad.

(Top right) A decade later, Baldwin had added more power and removed some of the Victorian frills for the type used by California Lumber Co.

(Center left) By 1900, Baldwin's improved 2-6-2 for Whitman Logging Company's C. B. L. Railway assumed the classic tanker lines.

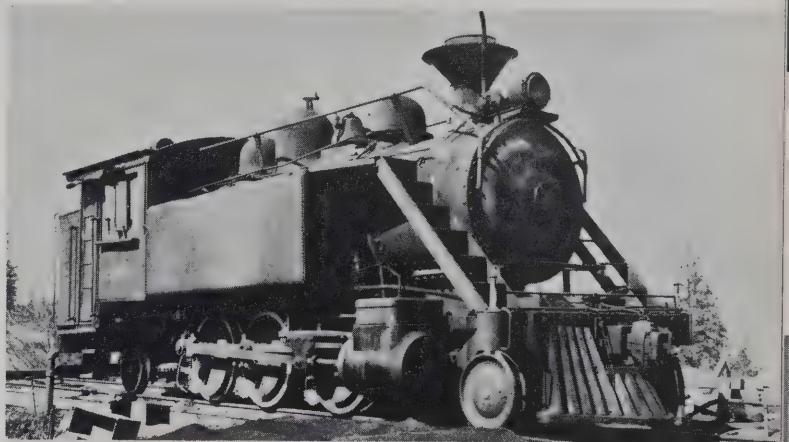
(Center right) Spunkiest rod locomotive of its size was the rating given this Porter 2-6-2 when it appeared in 1912.

(Bottom) Minarets type produced by American Locomotive Co. in the '20's became the most powerful single-expansion, two-cylinder, saddle-tank engine ever built. (Jack's Photo Shop)





REFUELING was often done in the woods from a tank car spotted on a convenient siding. Weyerhaeuser Timber Company's Mallet Number 110 carried oil in a cab tank and water in side tanks to add weight over the driving wheels. String of electric lights on the sides of this locomotive permitted the crew to "count the parts" during night operations.

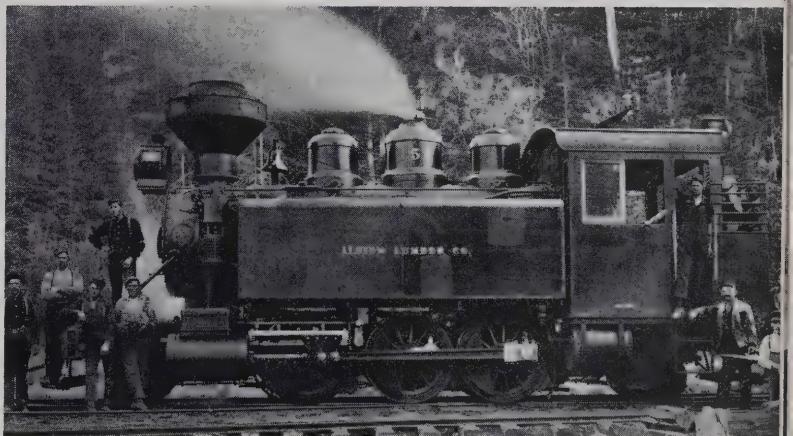


SIDE-TANK logging locomotives were first built by Baldwin around the turn of the century.

(Top right) Craig Mountain Railway's One-Spot was built in 1910 with stairways over each tank.

(Right) Trim lines of Albion Lumber Company's Number 5 represented the peak of contemporary efficiency.

(Bottom) Ultimate in side-tank power was Weyerhaeuser's 132-ton Mallet 2-6-6-2 put to work in 1929 at the Longview branch

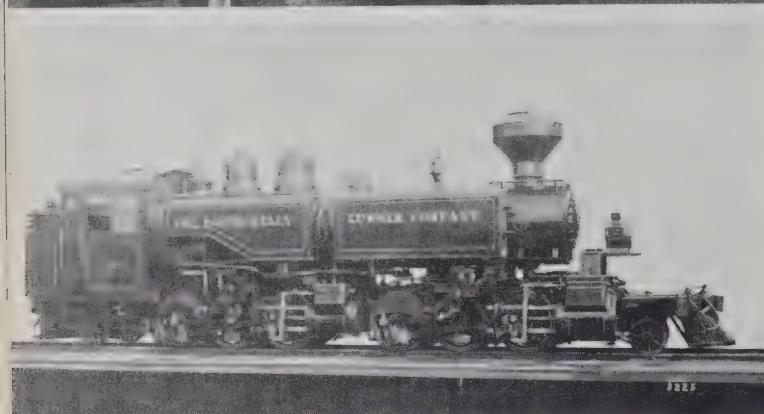


(Escola collection)

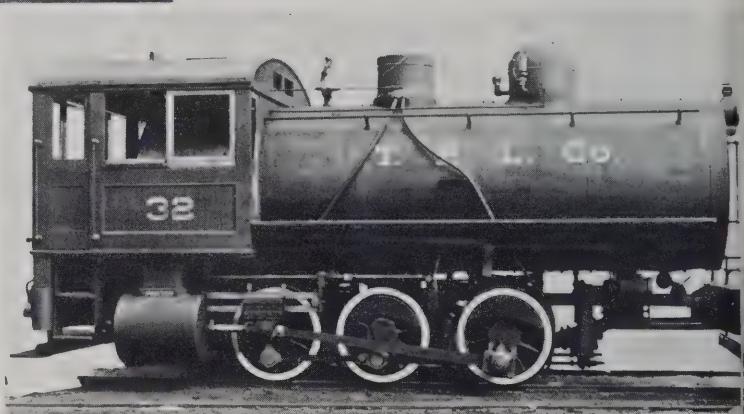




ARTICULATED locomotive with independent truck suspension had obvious advantage on curves. Baldwin Mallet Number 201 crosses the Weyerhaeuser Timber Co. bridge near Kelso in 1952.



MALLET LOCOMOTIVE delivered to Booth-Kelly in 1910 was the first of its type to be equipped with side tanks. The 100-ton wood-burner proved an immediate success for main line log-hauling and the company later bought two more.



FIRELESS STEAM locomotive was billed by Porter as the answer to the forest fire problem in the '20's. Steam was obtained from a stationary source, such as a lumber mill boiler, and stored in the "rolling pressure cooker."

LOCOMOTIVE NUMBER 250 of Sumpter Valley Railway was one of the only two narrow-gauge Mallets ever used in the United States. Both were fixtures of the "Stump Dodger" line until sold in 1947 to International Railways of Central America.

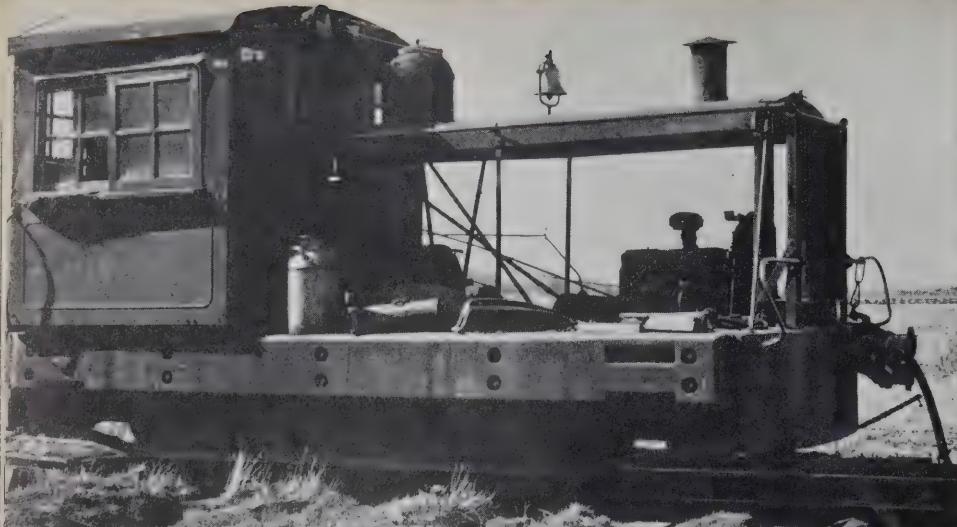




GEARED DIESEL locomotive was produced by Heisler in the late '20's. The hybrid was supposed to combine the advantages of steam geared power with Diesel economy, but failed to make the grade with loggers. (Miller Freeman Publications)

ELECTRIC LINE of Red River Lumber Co. used Baldwin-Westinghouse freight motors with offset pantographs. Power was provided by hydro-electric facilities at nearby Lake Almanor.





GASOLINE LOCOMOTIVES, such as this Plymouth, proved inefficient for most log-hauling duties. Placement of sand dome, bell and "smoke" stack is consciously reminiscent of a steam model.



GYPSY-RIGGED locomotives persisted into the 1940's. This wood-burning Heisler was used on the narrow-gauge line of Stoddard Lumber Co. in World War II.

(Library of Congress)



SEQUOIA TYPE locomotive was a modified Prairie 2-6-2 developed by Baldwin Locomotive Works for Western logging roads. This pilot model was displayed at the Panama Pacific Exposition in San Francisco and later made the rounds of logging camps as a demonstrator.

(Jack's Photo Shop)

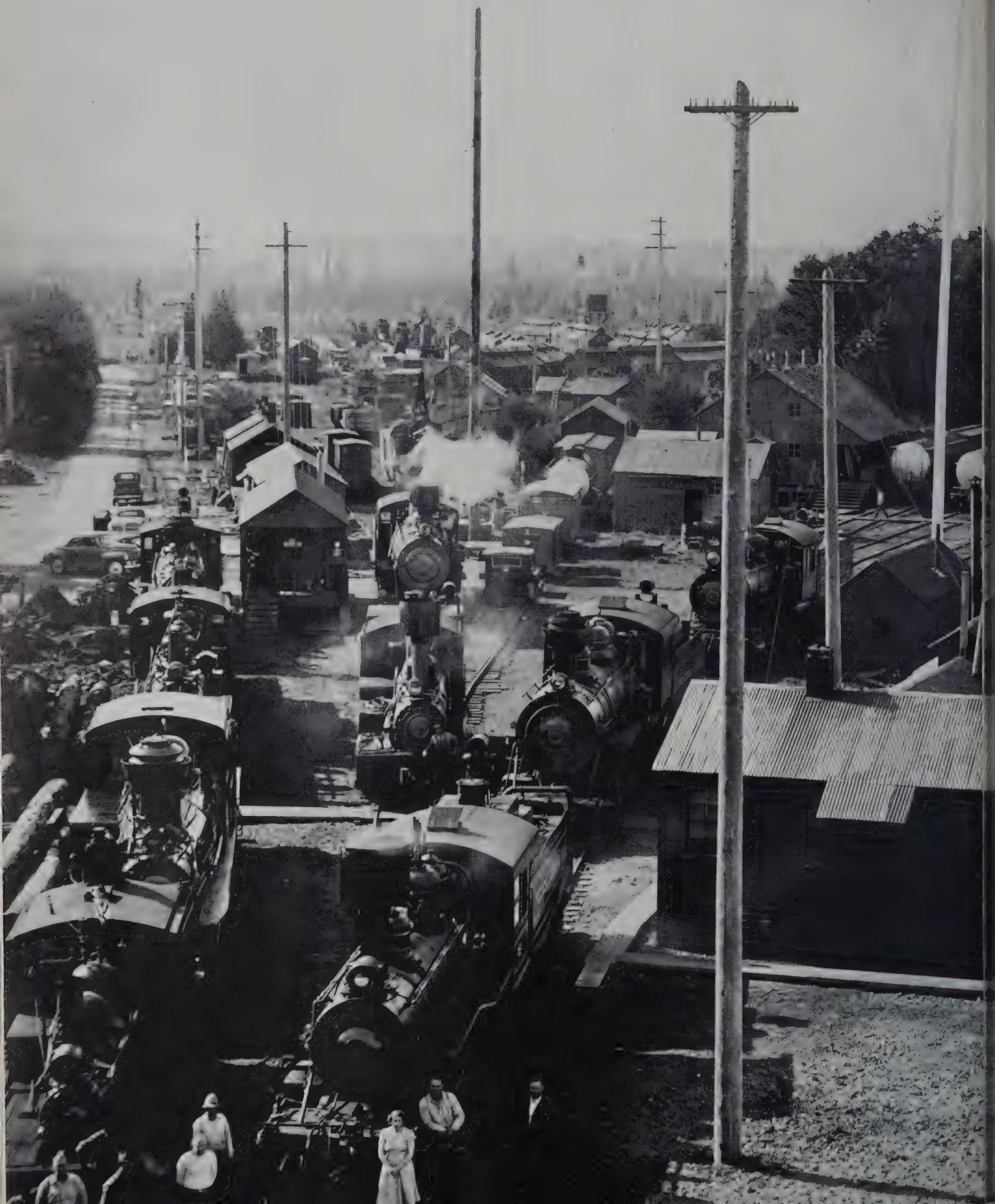


LARGEST LOCOMOTIVE ever built for logging service was Weyerhaeuser Timber Company's Number 200. It was a 2-8-8-2 superheated Mallet of 178 tons outshopped in 1929. With 75,000 pounds of tractive power, it could haul 100 loaded log cars up the 3.7 per cent grade of the Longview branch.

DIESEL locomotive of Red River Lumber Co. was the first to be used successfully for log-hauling. The 100-ton AMERICAN-GE was placed in service in 1926. (Miller Freeman Publications)

(Next page) LOCOMOTIVE ROSTER of Polson Logging Co. in 1940 made an impressive line-up of power. Sharp eyes will be able to spot 14 locomotives in the Kinsey photo. Some of these engines are still being used for log-hauling by Polson's successor, Rayonier, Inc.







POLSON Logging Co.

Tinsey
PHOTO
#9



TOWN ON WHEELS heads for a new show on the Cherry Valley Logging Co. line. Some of these camp car communities were moved into different counties, and one even changed states. (Darius Kinsey photo from Jesse Ebert)

LOGGERS' CAMPS on wheels first appeared around 1910. They kept the woods crews closer to their work and permitted the relocation of the camp as timber supplies were cut out.





BUNK CARS were not noted for luxurious appointments. There's reason to believe that the photographer had to clear away an extensive array of hanging sox and underwear before this picture could be taken. Brake wheel at end of car was a standard fixture.

"MUZZLE-LOADING" CAR with rear entrance was used by Snoqualmie Falls Lumber Co. as office and commissary in 1917. Other cars were used for sleeping, eating, cooking, recreation and equipment maintenance.





DINING CAR was usually the center of rail camp life. As in all camp cars, the floor boards were other than tongue and groove so that they could be easily replaced after scarring by loggers' caulked boots.



EMPTY BOTTLES and dude clothes attest that this northern California camp car scene was photographed on a Sunday morning. The rough life in early rail camps was brightened only by railroad trips to the nearest town.



COOKHOUSE SCENE at a Weyerhaeuser rail camp about 1920 shows, left to right, young bullock or scullion, chief cook, two assistant cooks and female flunkie.

PORTABLE TOWN out of Weyerhaeuser's Camp McDonald operation could be railed from place to place as new logging shows were established. Building in center foreground with skylights and end windows was headquarters for the saw filer. Mt. Rainier in background.



WOODS CREW was hauled between camp and the logging side by flatcar. This early model features the luxury of logs for seats.





VEHICLES for hauling woods crews assumed many forms, but were always referred to as "crummies."

(Top left) Train of converted hand cars at Weyerhaeuser Timber Company's Longview branch.

(Top right) Number 7 crummy of J. Neils Lumber Company's Montana operation was graceless but efficient.

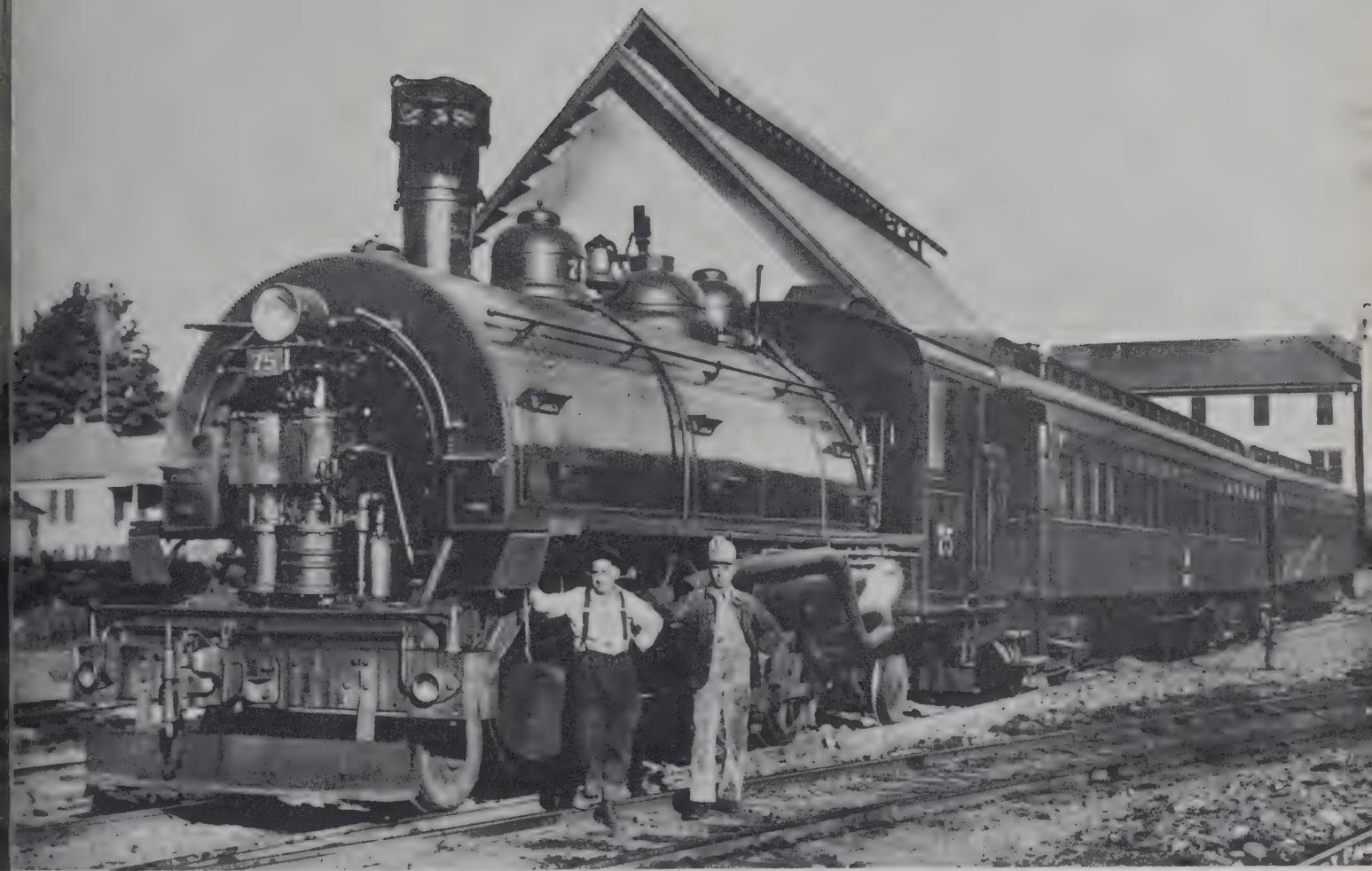
(Center left) Fallers load saws on gasoline-driven model at St. Paul & Tacoma Lumber Co. operation.

(Center right) "Fresh Air Taxi" was the name given to these Weyerhaeuser cars at St. Helens tree farm.

(Bottom left) McKeen car of electrified Red River Railroad had seen better days in California interurban service before hauling loggers.

(Bottom right) Gasoline passenger car of McCloud River Lumber Co. was of practical design and uncertain ancestry.

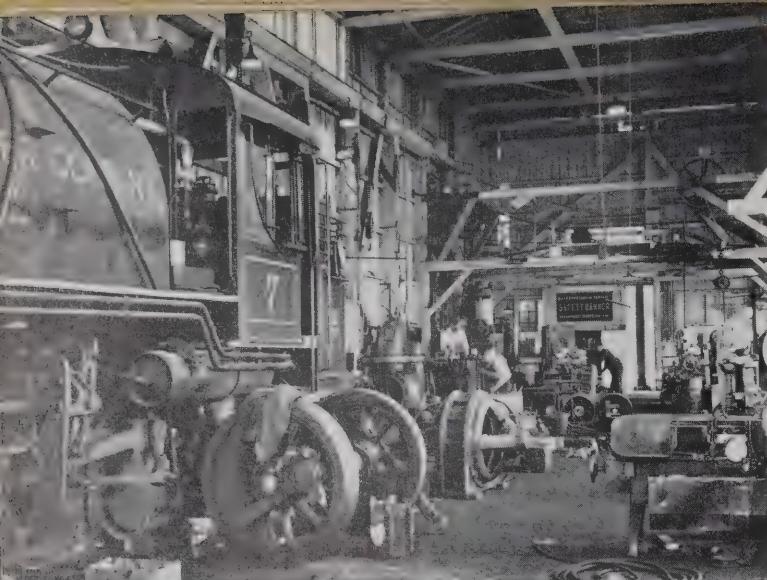




STEAM-HEATED CRUMMY was introduced by West Fork Timber Co. in the early '30's. Owner Tom Murray, left, rigged up a steam hose from the locomotive to the coaches and some times had difficulty in unloading the loggers on a cold day.

(Right) **FLATCARS** with roofs marked an early improvement in transportation for woods crews.





REPAIR AND MAINTENANCE facilities for locomotives and rolling stock were supported only by large or prosperous logging operators.

(Top) Shop of White River Lumber Co. was typical of medium-sized facility in World War I era.

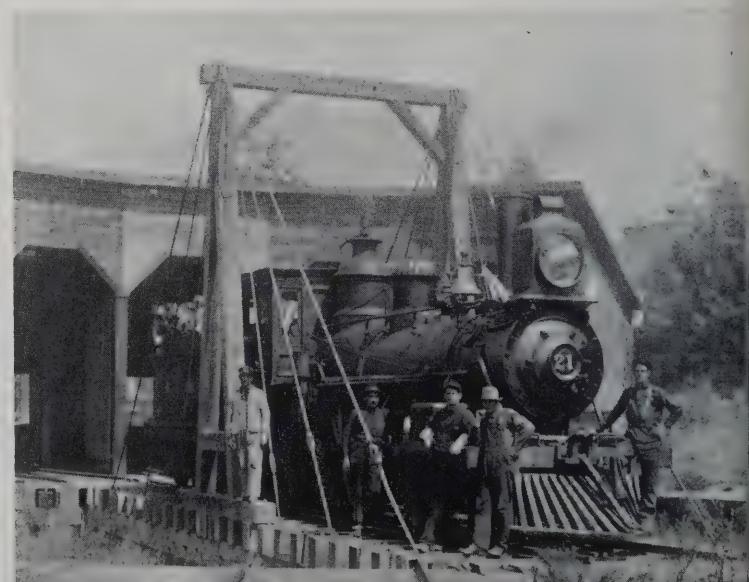
(Center) Red River Lumber Company's elaborate layout in the '20's was the best in the industry.

(Bottom) Shay gets a going-over in a model machine shop of the last century.



SHOPS of Weyerhaeuser Timber Co. in the '30's were typical of large operations. (Top) Camp McDonald. (Lower) Headquarters camp near Longview.

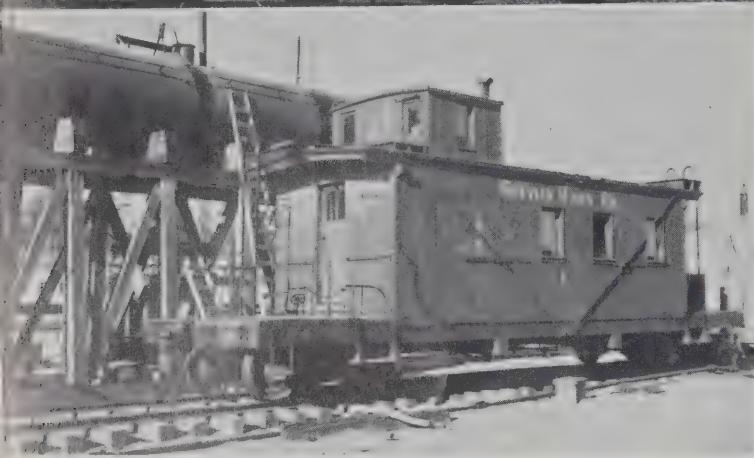
TURNTABLE was a luxury seldom found on logging railroads. The model below was owned by The Pacific Lumber Co. at Scotia. It supports their high-stepping Rogers 4-4-0 which was built in 1886.





DOGHOUSE on the tender was a necessity for large logging locomotives. It sheltered the conductor who kept an eye on things while the engine was traveling backwards. The con house as interpreted by (Upper left) Fruit Growers Supply Co., (Center right) Schafer Bros. Logging Co., (Bottom left) Weyerhaeuser Timber Co., and (Bottom right) Chehalis Western. (Top right) Rayonier, Inc. today employs the "rolling out-house" type inherited from predecessor Polson Logging Co. (Center left) Ultimate in comfort was offered conductors on the Shevlin-Hixon line with this converted Chevrolet coupe body.





CABOOSE on a logging line was known as the shack, cage, brain wagon or a dozen other names, and had as many uses. It was sometimes employed as a work car, fire car, ambulance, personnel carrier and mulligan car for food delivery. Home-made variations include Pickering Lumber Corp., California Western Railroad, Shevlin-Hixon Co. and Swayne Lumber Co. (Harold K. Vollrath photos)

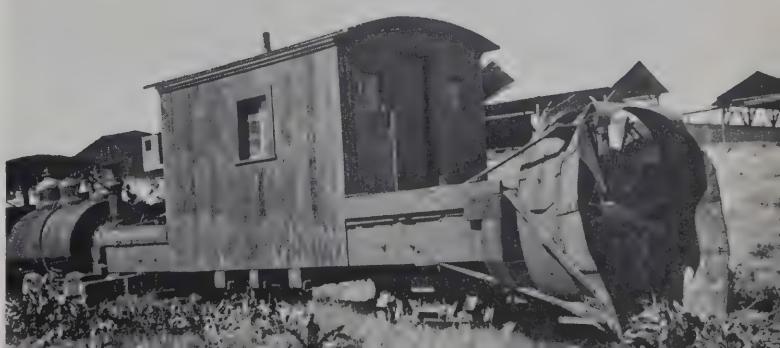
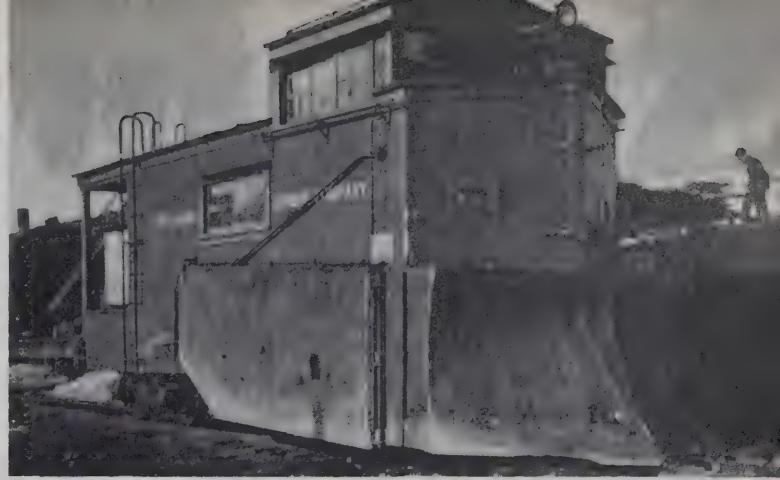
MOTOR VEHICLES were easily converted for use on logging lines. (Bottom left) Superintendent's inspection car on Standard Lumber Co. line prior to World War I. (Bottom right) Dodge truck ambulance of the early '20's carried lucky number of "11," loggers claimed, because one would be lucky to come out of it alive.





WINTER BEAUTY goes unappreciated by the men who had to keep the logging lines open to the mill. Snow-clearing scenes above photographed at Red River Lumber Co. operations in the '30's.

SNOW PLOWS were needed to keep the logging lines open at higher elevations in the West. (Top) Basic pusher type with wing gear was used by Potlatch Lumber Co. in northern Idaho. (Center) Special wing-type plow of Weyerhaeuser's Klamath Falls branch scraped and packed the snow along the right of way. (Bottom) A pair of ancient locomotives converted to rotary snow plows for use in the Sierras.





SNOW JAM stalled the powerful plow of Red River Lumber Co. after a four-foot snowfall in March, 1938.



WATER TANK CARS were required to be on hand for fire-fighting duty as the result of state fire protection laws. Some logging operators carried a tank car with the locomotive during fire seasons.



PATROL CAR of White River Lumber Co. carried hose and tools.



STANDBY CARS of Long-Bell Lumber Co. at Longview.

FIRE CALL at Weyerhaeuser's Longview branch brought standby locomotive to the siding where the fire train was always in readiness. Headquarters personnel and crews from other parts of the woods have already been taken to the fire scene by speeder.

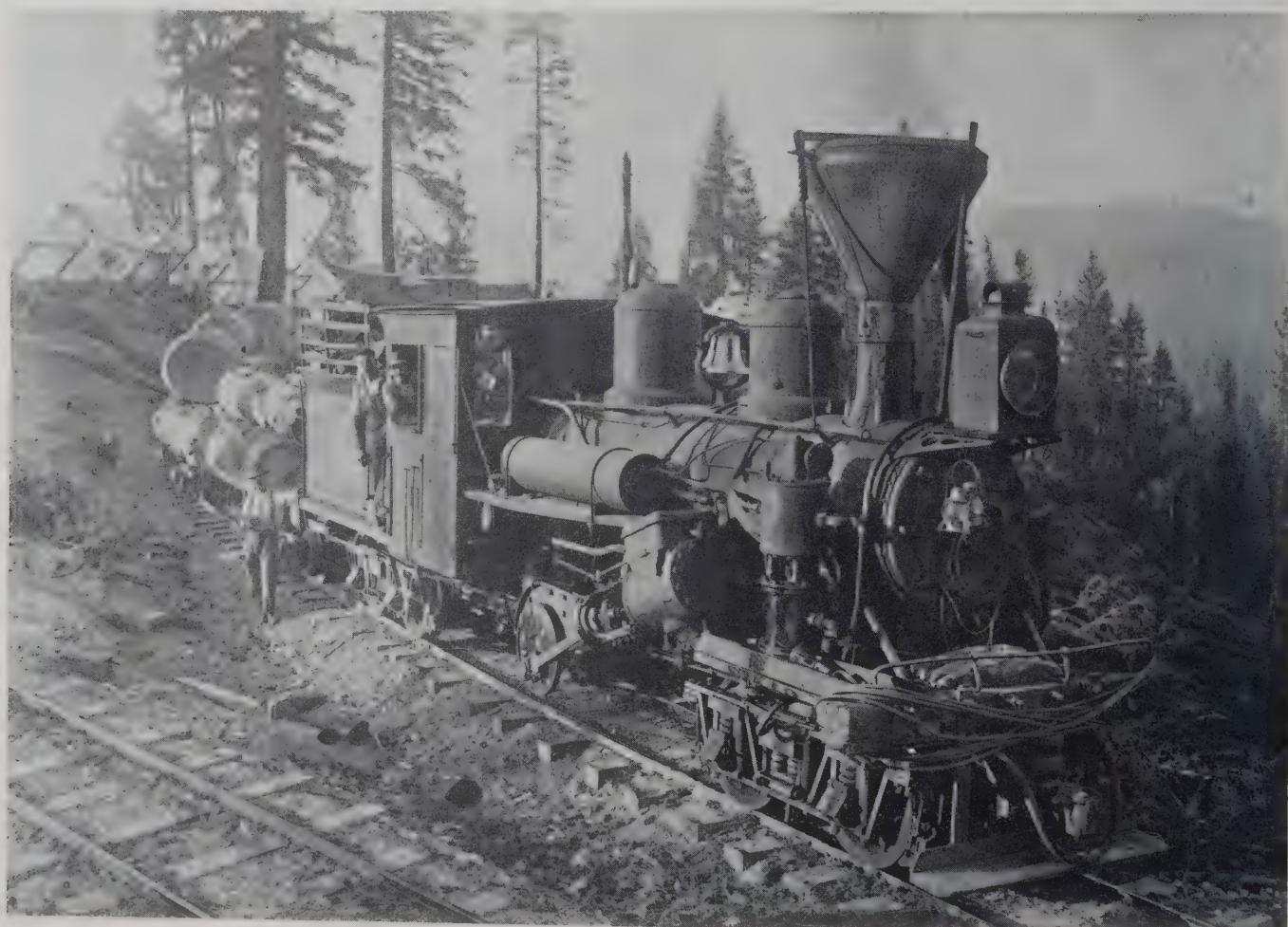
FIRE IN THE WOODS held a special terror for train crews, who realized that a burning trestle might separate them and their train from safety. (Below) Trestle on C. D. Danaher Pine Co. line is protected by a pump and hose provided by Shay Number 9. Mop-up work by crew of Mallet Number 106 at Weyerhaeuser's Vail operation





SPARK ARRESTERS were insurance against forest fires in the dry summers of the Sierras. Double-tubed spark catcher was used on "Betsy," Madera Flume & Trading Company's 10-ton geared locomotive, which was hauled up the mountains to start the first railroad logging show in the Sierras.

SINGLE-TUBED CATCHER was added to the clutter on Lamoine Lumber & Trading Company's narrow-gauge Climax in 1898.





GROTESQUE TUBE and ash can arrangement on Clio Lumber Company's narrow-gauge Shay was a noble effort, but was discarded because it impeded steaming efficiency.

TRESTLE of Clemons Logging Co. went up in flames during a 1918 forest fire. The entire operation was closed for three days while woods crews were put to work rebuilding the burned-out section.





METAL FLASHING was sometimes placed over trestle stringers as a fire prevention measure. The sparks which flew from locomotive brake shoes on a downgrade constituted a serious fire hazard.



JOINING THE BIRDS

That highball logging was the most dangerous major occupation in the West could not be denied. It was a fact of woods life accepted by the logging operator and his employees, and to a lesser extent by custodians of state industrial accident funds, who occasionally were forced to dip into the red in order to compensate injured loggers.

A primary contributing factor was the logging railroad. It was a constant hazard to trainmen, woods crews, casual passengers and unwary man or beast.

Perhaps as many as two or three thousand persons lost their lives in the assorted derailments, collisions, explosions and crack-ups that plagued the western logging pikes.

The woodsman's life was always in danger around the rails and he was sooner or later made aware of it. Whether trainman or logger, he had a subconscious set of reactions that came to his aid in emergencies. "Joining the birds" was the most frequently used of these measures, and his ability to jump safely off a troubled train was developed to a point of admirable effectiveness.

Staying alive around the logging railroad was looked upon as a sort of game in which many woodsmen won, but an appalling number lost.

Some of these mishaps brought high tragedy, as when the superintendent of Sierra Lumber Co. watched helplessly while his son died on the tracks, or when the wife of an engineer at McDonald & Vaughan's camp fell under the wheels of his train and was killed.

Other accidents could be spectacular, annoying or even funny.

Runaway trains were probably the greatest source of serious accidents. The cause may have been inexperience or poor judgment on the part of the engineer or his crew. It could have been rails made slick by ice, dew, rain or machinery grease. Maybe the sand pipes were clogged by mud or the brakeman had not done his job. The reasons for a large number of runaways will never be known because of the lack of survivors.

The other elements for disaster were always on hand: dangerous terrain, heavy log cargoes weighing in the hundreds of tons, questionable equipment and a disregard of safety considerations that sometimes amounted to bravado.

Many an engineer on the downgrade found that he had "lost his air," and without brakes, his safest course would be to jump, letting the uncontrolled train safely pass him by. This understandable desire to abandon the runaway and protect the lives of himself and the trainmen, however, put a severe strain on the rolling stock.

A train under such circumstances had several courses to follow. It could come to a more or less spectacular stop by the simple means of derailing itself. If could leave the tracks at high speed and plow into a bank or fly out into a canyon. On a few horrifying occasions, it might continue on down to the mill, creating a terminal jumble of logs, lumber, machinery and possibly bodies.

The logging railroad engineer was no coward. Indeed, one look at his facilities and equipment would usually be enough to convince the skeptic that the engineer was a man of courage.

Unless lives were in danger, the hogger didn't want to abandon his train, and some of the actions he took to prevent the final alternative are a credit to his breed.

When faced with the lost brakes situation, the customary procedure for the engineer was to slam the engine into reverse, "hang the throttle over the tank," and join the crew in hitting the brush. In a number of such cases, the trainmen sat down to wait for their runaway train to return. They had been through this routine before, knowing that the consist would meet a grade ahead which would slow it, stop it, and roll it back to the waiting crew.

Mile for mile, the logging roads probably presented the most dangerous railroading conditions of all time, providing many opportunities for heroism on the part of their trainmen.

An engineer on Polson Logging Company's Number 55 Shay was among the many hoggers

who earned the lifelong nickname of "Casey Jones." After signalling the fireman and brakeman off the train to safety, he rode out a runaway train in an attempt to stop it. A sharp curve helped his mission. As each of the cars rounded the turn, their momentum unloaded the logs. This lightened the train so that it could be brought to a stop. But Number 55 was never seen on the rails again. The strain of the runaway trip had torn the drive mechanism loose from the frame.

A runaway on Butte County Railroad in 1909 killed the engineer, fireman and brakeman, but a quick-thinking conductor prevented a greater loss of life. Realizing that the air brakes were gone, Conductor Johnson stepped between the bouncing cars and uncoupled the caboose. With the help of several logger passengers, he slowly hand-braked their car to a stop.

A clogged sandbox caused a runaway on the new line of Canyon Lumber Co. in 1905. The engineer whistled to the crew to join the birds and refused to leave his train until the others were safely off. No injuries were recorded in the pile-up that followed, but Canyon's brand new locomotive was an uninsured, \$10,000 loss.

The whistle warning became a sort of tradition on logging roads. Safety laws later made whistle signals mandatory for a distressed train, but the law was not necessary for the woods engineer. He knew most of his crew and logger passengers by their first names, and was not only responsible, but concerned for their safety.

This esprit de corps was shared by others who worked around the railroads. It was the shop crew of Puget Sound & Baker River Railway who became heroes in 1923, when screeching rails telegraphed trouble on the grade. Six loaded log cars had gotten away from the woods switching crew and were rolling down the main line. A few miles below, Locomotive Number 2 was steaming up the grade, its crew unaware of the danger.

With only the knowledge that the Two Spot was below and some kind of trouble was above, a half dozen shop workers jumped on a speeder and headed up the grade. The cause of the singeing rails was soon evident, as the runaways, with smoking brakes, bore down on the men. Abandoning their speeder, the shop men grabbed brake sticks and assumed strung-out positions alongside the track. As the train went by, each man ran alongside a car and engaged his stick in the brake wheels. Slowly the runaway came to a stop.

"We never did tell the boys on the Two Spot what happened that day," recalls Shop Foreman Fred Nielson. "They usually had enough other things to worry about."

Among their worries was the aging piling on P.S. & B.R.'s wharf on Puget Sound. It finally collapsed one day, taking Locomotive Number 1 into the bay, along with its crew. Brakeman Albert Evans popped up to the surface and noted that the engineer was having trouble. He swam over to the floundering man and kept him from drowning until a boat came to the rescue.

Rotted timbers on Oregon, Pacific & Eastern's bridge at Walden plunged Locomotive Number 8 into Mosby Creek on a September day in 1924. As the caboose at the other end of the train snapped to a halt, Conductor Durham realized what had happened. He ran down to the ruptured bridge and worked his way through the water into the locomotive cab. Through bubbling water and escaping steam, he managed to turn off the fuel line which already was spreading oil dangerously. While he prevented a fire, it was too late for him to do much for the trapped engineer and brakeman. Both were scalded by steam and died in a hospital that evening.

It was a ghastly, but common enough fate for trainmen. Even a simple derailment could cause death or painful burns from escaping



SLIDES plagued the hastily built government spruce production roads in World War I. Rail-borne steam shovel was digging out slide Number One when it was engulfed by slide Number Two. Soldiers and civilian workers come to the rescue on the Clallam County Railroad in 1918. (Washington Historical Society)

steam. The locomotive whistle itself was responsible for fatally scalding three men in a wreck on the Monte Cristo line.

For a while, empty cars which ran away from the upgrade train were a dangerous nuisance on the C. D. Johnson Lumber Co. road. The train crew came up with a simple safety device. Before each run back to the woods with empties, the brakeman stuck an alder sapling in the drawhead of the last bunk car. Whenever a glance back at the train showed the tail-end marker missing, the brakeman knew that one or more cars of the consist was headed in the wrong direction.

The log train runaway could be a frightening spectacle. A 20-car juggernaut on the Twin Falls Logging Co. line in 1910 attained a speed of 80 miles an hour before winding up in a pile of splinters at Yacolt. The force of logs hurtling off runaway cars on the Canyon Lumber Co. line sheared off a pair of hemlock trees three feet in diameter.

Flying logs could clip off telephone poles, too, as Conductor Frank Grubb of Oregon & Eureka Railroad found out. He had left his string of loaded cars for a moment to phone the dispatcher. Inside the phone booth, he didn't notice when three cars quietly drifted off down the hill. Faster and faster went the runaways as Grubb, unaware, shot the breeze with the lonely dispatcher. The first message that the luckless conductor received from his runaways was when he suddenly found himself standing on his head. The cars had derailed down the line, scattering logs across the landscape. One of them had severed a phone pole without breaking the line, and the pressure on the wire had neatly flipped the telephone booth upside down along with its surprised occupant.

Because train orders were seldom issued on logging lines all that the engineer had to watch for, went the saying, was slides, washouts, deer, cattle, loggers, fallen trees and the boss' speeder —wherever that was.

Motorized hand cars appeared around 1900, and logging company officials of various stripe were quick to discover their advantages for quick trips to the woods. Along with crew cars, ambulances, work cars and other unscheduled vehicles that might be on the track, the speeders added considerably to the hazards of rail travel. Superintendents by the dozen were killed or injured over the years when their unannounced trips resulted in collisions with trains.

Such a crackup on Simpson Logging Company's line brought one of the earliest overtures



WASHOUT in the Santa Cruz Mountains at the turn of the century sent "Betsy Jane" wallowing down the creek. California-made saddle-tanker was used successively on Santa Cruz & Watsonville Railroad, Loma Prieta Railroad, Pajaro & Santa Cruz Railroad and SP's Loma Prieta branch. (SP photo from Amaragosa Memorial Library)

to the cause of safety. Victims of the collision were the manager and railroad superintendent of the company, who immediately ordered all rolling stock, including locomotives, to be painted an unartistic, but highly visible shade of orange. Section Boss Ed Dooley received the word, along with several gallons of paint, on March 17.

"The Chief may be a foine man," Dooley spouted, "but oi can't do this terrible thing of a St. Patrick's Day." With commendable under-

standing, the management allowed the Irishman a one-day delay in applying the orange paint.

Bill Deary was another stubborn Gael who became a legend in the industry. As manager of Potlatch Lumber Co., Big Bill also had charge of Washington, Idaho & Montana Railroad. His speeder, equipped with a buggy seat, was frequently encountered out on the line. Locomotive engineers learned that on such occasions they were expected to stop their trains, back up, and let Deary's chariot pass at the nearest siding. The procedure applied even to the regular passenger runs.

The inevitable happened one day when a downgrade log train refused to yield the right of way to Deary, tossing him and his speeder into the brush. The fact that the boss was uninjured and his hated speeder a total wreck brought joy to the woods. Perhaps the Old Man had learned his lesson the easy way and the trains could begin to run on schedule.

But the hope was short-lived. A few weeks after the wreck, the boss returned to the rails on the most elegant speeder of all time. It had not only a buggy seat, but was graced with a tasseled canopy and an elaborate paint job. As long as he was alive, Deary's rail-borne surrey with the fringe on top continued to demand and receive the right of way.

Pat Lyons, logging super of Swayne Lumber Co., used a converted touring car speeder which he described as a "dehorned Ford fitted with permanent flat tires."

One day in 1919, Lyons picked up a visiting salesman who welcomed the opportunity to ride back to camp in the flange-wheeled Model T. As the car picked up speed on the down grade, the salesman repeatedly attempted to slam his door shut.

"Oh, that door won't close," Lyons said. "I took off the catch."

"Why?" asked the apprehensive passenger.

"Because this car jumps the tracks so often," Lyons replied, "and I want the door to be open so I can crawl out from under."

Those who worked on and around the railroads became adept at righting derailed rolling stock. The ability was particularly evident when the accident occurred on the daily trip back to camp or on the Saturday train to town. Accidents on company time seemed to be more time-consuming.

So many derailments occurred on the average logging line that the rerailing process became almost routine. Most spur line locomotives carried as standard equipment several heavy chunks of steel called humpbacks or car frogs. Following a simple derailment, the train crew would dismount, pick up the car frogs and spike them to the ties ahead of the misplaced wheels. When the car was pulled by the locomotive, its wheels were forced to climb the frogs back onto the track.

Derailments which couldn't be handled by frogs or hand-operated jacks sometimes called for the building of a temporary parallel track, upon which the errant rolling stock was steamed or hauled back to the original rails. The proximity of a woods donkey engine was a great help in more serious accidents and in later years the crane-like boom of the cherry picker could be called upon. On some occasions, the logging operator was obliged to borrow heavy equipment from the nearest mainline railroad company.

Train crews became "catty" about questionable sections of track and developed a number of expedients to avoid them. One of these was the car line. By means of a long cable attached to the pilot, the locomotive was able to pull cars across doubtful track without endangering itself.

The reverse was a trailer, a flat car pushed ahead of a locomotive to couple onto cars located across track which might be unsafe for the heavy locomotive. Sometimes cars were "jill-poked" or poled by hand in and out of sidings.

An unusual method of combatting slippery rails was developed by Anaconda Copper Mining Company's lumber division. When ice or snow made the track dangerous, men were stationed at intervals along the grades to spread hot sand on the rails.

In the fading days of the Chehalis, Cowlitz &



BOILER EXPLOSION on May Creek Logging Company's new Climax took the life of engineer and fireman near Kennydale, Wash., in 1911.
(Don Clark collection)



Cascade line, crews refused to take trains across a shaky trestle over the Cowlitz River without a locomotive at either end. The head-end power was abandoned at one end of the trestle and pushed across by the trailing engine. When the first locomotive and cars were safely across, the crew would leave the rear engine, walk across the trestle, remount the leading locomotive and resume their run.

No matter how skillful the woodsman became in avoiding trouble, the dangers of railroad logging were always waiting. For an official of Clover Valley Lumber Co., the end came when he absent-mindedly crossed the tracks in front of a train while reading a newspaper.

Or, the railroad could be what the lawyers might call "an attractive nuisance," as in the case of a well-known Pacific Northwest logging operator. This logger's reputation was based more on his legendary drunken binges than anything else. On one alcoholic occasion, he ordered his engineer off the train and took the locomotive on a frightening race down the main line. Fortunately, only one life was lost in the resultant wreck—that of the owner.

Accidents in the woods could prove to be a cruel thing to injured men. Doctors, hospitals and sometimes even first aid was available only at the other end of the track. If a log train was already on the line, it was impossible to give clearance to a special speeder or an ambulance car. Or the accident itself might have blocked the track or otherwise put the railroad out of commission. The track was literally a lifeline and it failed with tragic regularity.

No doubt there would have been many more accidents had not the average speed of a loaded log train been eight and-a-half miles an hour.

Engineers who survived an accident were subjected to the logger's biting humor. A hogger

on the Dempsey Lumber Co. line carried with him the lifetime stigma of being called the king of the milk run for a collision with a speeder which was bringing a load of milk to the camp.

A less flattering nickname was applied to the engineer of a Warren Spruce Co. train which piled several empty cars into the camp latrine pit. The unhappy loggers who had to dig out the cars were the first to apply the unprintable name, which followed the engineer from camp to camp.

Equally unpopular was the engineer at Conlough Company's camp, who let daylight into the cookhouse with his Shay. As it was just before mealtime, the loggers never allowed the engineer to forget his untimely deed.

Perhaps the most unpopular woods hogger of all time was the engineer of a runaway Suther Valley train which deposited its cargo of beer kegs across the Oregon countryside instead of at the logging camp.

Slides and washouts were a common cause of accidents on the hastily-built logging lines. Union Lumber Company's California Western Railroad was especially hard-hit after the earthquake of 1906. Winter storms that year caused scores of slides and took out eight bridges. It was three months before a train could be moved over the line.

Storms once pushed a church onto the tracks of Ostrander Railway & Timber Co. The editor of *West Coast Lumberman* pointed out that Ostrander President E. S. Collins was an active church worker, "and his friends have been unkind enough to say that it looked like a visitation of Providence."

Among the notable washouts were Everett & Monte Cristo Railroad's loss of every bridge in 1892 and the collapse of 1400 feet of trestle on Oregon Lumber Company's line near Dee in

1921. For spectacle, however, nothing equalled the disintegration of Seattle, Lakeshore & Eastern Railroad's bridge over the Snohomish in 1888. News of the losing battle between men and the raging river brought spectators from miles around. For two days, they watched in fascination as pile driver crews and boom men attempted to save the bridge pilings. They continued to watch in horror as the bridge slowly gave way, and swirled off downstream with men and equipment. Miraculously, no lives were lost. Pieces of the bridge were recovered miles downstream and shipped on flat cars back to the original site. Within two months, the bridge was again carrying log cars.

The hazards by which Nature vexed the log train seemed endless. A tree might fall across a flatcar carrying the woods crew, as it did on the Seattle Logging Co. line. Or one might fall on the locomotive, as happened on Peninsular Railroad and on Cherry Valley Logging Company's line.

The engineer and fireman of a West Oregon Lumber Co. train were killed in 1912 when their locomotive was struck by lightning. A feisty bull elk took exception to the whistle of an Idaho log train one day in rutting season, and charged the locomotive with suicidal results.

It was bears which stopped all operations for two days at Linberg Bros. camp in 1928. Not even the hardiest logger would go into the woods as long as a threatening mother bear and her two cubs were wandering around. Attempts to drive the bears away were unsuccessful and even the Kitsap County game warden gave up. The impatient woods super finally rounded up a dozen volunteer loggers, armed them with

HEISLER NUMBER 5 of Buffelen Lumber Co. met slick rails coming off the hill at Eagle Gorge one morning in 1926 and plunged into a canyon. Crew of the runaway train jumped and there were no injuries.



rifles and pistols, and sent them back to work in the woods.

Of all the dangerous surprises which faced the engineer, the most common turned out to be stray livestock on the track. Many timber companies, particularly in the pine region, leased their land to graziers. In some cases, the grazing income never matched the payments made to aggrieved cowboys and sheepherders, who turned up with as many dead animals as they thought the railroad management could afford to indemnify.

It seemed that only the most valuable livestock succumbed to the passing log trains. The agent of Puget Sound & Grays Harbor Railroad in 1886 reported to his boss that he had no choice but to pay Farmer Duckworth \$75 in damages for a sickly old cow that hadn't the energy to move off the tracks. The farmer admitted having paid considerably less for the beast, but explained in a story that was to gain familiarity, that it was a good milker and heavy with calf at the time.

A state law came to the aid of Colorado railroads in 1885. It called for standardized payments to owners of animals killed on the tracks. Texas cattle brought from \$12 to \$25 each; calves, \$10; American sheep, \$2.50; and Mexican sheep, \$1.50.

The Washington territorial law dealing with the matter called for prevention rather than cure. According to the early lawmakers, "a dog is necessary to put to flight cattle obstructing the track. A dog shall be carried on the cow-catcher of all trains." The edict was never repealed.

The all-time record for bagging domestic stock in one day belongs to Number 4 locomotive of Arcata & Mad River Railroad. Working out of Glendale, it ran over two large beef steers and four geese without damage to the locomotive.

The encounter between log train and cow, horse, sheep, goat or pig was frequently fatal to the straying animal, while just a nuisance to the crew. It could be the other way around, however, as demonstrated by a bloody accident on Lake Valley Railroad in 1891. Running the downgrade from Myers to the Lake Tahoe log dump, the last train of the day was carrying five loaded log cars and a crew of Chinese cordwood choppers. A stray yearling on the track brought the train to such a jarring halt that the forward trucks were jammed into the firebox. Amidst flying logs, four Orientals were killed and

many injured. The engineer was permanently crippled. Bodies of the Chinese woodsmen were taken to San Francisco and placed on a steamer for the last leg of the voyage to their ancestral homeland.

Sooner or later, even the least intelligent domestic animals learned that the bells, whistles and frightening noises of the highball train brought danger, and kept away from the rails. How often impatient engineers hastened the conditioning process with a blast of steam, a handy B-B gun or a nudge of the pilot will never be known.

To the assorted acts of God which confronted the railroad operators must be added an appalling record of man-made mishaps. All the frailties of the human soul were accounted for in the causes of grief which befell log trains over the years.

In 1895, Superintendent Sol Simpson of the Blakely road was obliged to issue warrants for the arrest of a group of religious zealots who had derailed a locomotive and were continuing to place obstructions on the rails. As members of the "New and Lateral House of Israel" sect, they felt compelled to hinder the Devil's mission, as symbolized by the clanking locomotive. The four men and boys who were apprehended received the benefits of a more normal Christian outlook by being permitted to leave town without punishment.

A series of mysterious bullet holes that they discovered in their locomotive at unpredictable intervals caused no little concern to the trainmen of a logging road near Sultan in 1901. The shots that caused them were never heard by the crew above the noise of the train. Sleuthing by local authorities eventually turned up the culprits. Instead of the madman or juvenile delin-

DERAILMENTS came with monotonous frequency on temporary spur lines. They seldom caused serious damage because of the slow pace of logging locomotives.



quent that was expected, the woods dragnet brought in some Chinook Indians. In a defiant assertion of their old beliefs, the redmen were trying to avenge the death of a comrade who had been run over by a log train.

The bitterness of the war between timber operators and the International Workers of the World, the "Wobblies," sometimes found an outlet on the logging lines. Every type of sabotage was inflicted on the rails and rolling stock during the World War I years and shortly after. Agents of the union loosened rails, greased the downgrades and placed dynamite on the tracks. Those trainmen and loggers who were resultantly killed or injured were just "scabs" anyway, went the reasoning.

The railroad played a part in retribution at the Big Creek Logging Co. camp. Manager David E. Stewart caught up with a pair of troublemakers in 1918 and with the help of 50 loyal loggers, took them out to a woods spur. Using hot gear dope from a locomotive, the would-be saboteurs were "tarred" and feathered. The Wobblies were then ridden along the tracks on cedar rails and turned loose in the woods. Stewart's camps became remarkably free of I. W. W. agitators.

In the 1940's and '50's, timber company trains often carried hunters into the woods in the seasonal search for deer, elk, bear and birds. The sportsmen would be dropped off at marked points along the right of way in the morning and picked up at the same point in the evening. One such "hunters' special," operated by Long-Bell Lumber Co. in 1952, carried a few riflemen who had been preparing for the day-long hunt by the use of liquid fortifiers. The engineer of the train was about to slow down for the next stop when a bullet zipped by his ear and rico-





TRAIN DISPATCHER and his control board were necessary to efficient operation of larger logging roads. But most lines with more than one train in the field relied on "smoke signals" from the wandering locomotives to set schedules and prevent collisions.

cheted around the cab. One of the eager passengers thought he had seen a buck, and failing to attract the engineer's attention by shouts, had delivered his request to halt the train by a more compelling means. The incident brought an end to all free rides for hunters.

Impatience in one form or another may have killed as many woodsmen on the logging roads as did carelessness.

Fridays and Saturdays, when in later years the men were allowed to ride the train into town for the weekend, brought a disproportionate number of accidents. Having just been paid, the loggers riding the "Millionaire's Special" were always in a hurry to reach the attractions of the city skid road. In an incident on North Bend Logging Company's line in 1920, six of them paid with their lives after persuading the engineer to take the downgrade without waiting for a counterweight.

Other would-be celebrants never reached the city lights, for the flat cars they commandeered for a quick trip down the grade met with disaster. Even idle locomotives were taken over by the impatient loggers who wanted to rid themselves of "camp fever."

Everyone in the woods envied the hogger. Just as many generations of youngsters around the world wanted to grow up to be an engineer, so did buckers, fallers, cat-skinners, whistle-punks, choker-setters and even the boss feel the yen to command the power of the locomotive.

The dreamed-of opportunity came to a member of the rigging crew at Schafer Brothers camp in 1913. The Schafers had just taken de-

livery of a brand new Heisler, but had no engineer to run it. In desperation, they gave the coveted assignment to a fast-talking woodsman, who assured them that he was competent, although admitting that he hadn't yet earned his engineer's ticket.

On his first run, the eager neophyte lost control of the loaded train on a six per cent grade. Just before the runaway crashed, the substitute engineer managed to follow his crew in jumping off the train. Wisely, he continued on into the woods.

The recently shiny Heisler was eventually recovered and sent to Tacoma for repairs which cost \$4,000. The incident came close to putting the Schafers out of business.

Misfortune of a personal nature later caught up with Peter Schafer when a Schafer locomotive rammed his automobile at a crossing. From a hospital bed, Peter claimed that the accident was a one-in-a-million freak—the train had been on time.

His brother, Albert, one day recognized a man he hadn't seen for some time. It was the missing "engineer" who had piled up the new Heisler.

"Where have you been all these months?" asked Schafer.

RADIO COMMUNICATION was a post-World War II innovation which kept the locomotive engineer in touch with the dispatcher, the woods crew and the conductor in the caboose.



"I been running," the ex-engineer replied.

The repentant woodsman was put back on the payroll, but in a capacity far removed from the railroad.

Errors in judgment by the men who ran the trains were common on the woods lines, where the disciplines and regulations of the mainline companies were impractical and unenforceable. The hogger was usually the highest paid man in the woods, aside from supervisory people, and had responsibilities to match. Due to the nature of his work, the engineer, along with the train crew, had an independence that was often envied by other woodsmen. And there was sometimes a bottle stashed away in the cab in violation of Rule G or its woodland equivalent. Considering the shabby equipment and hazardous working conditions that he often had to put up with, there was no man in the woods more deserving of an occasional sip of bottled "boiler water" than the train man.

The engineer of Royce Lumber Company's lone locomotive had a happy combination of jobs. He was regularly employed as the bartender of Eatonville's leading saloon, and parked

his idle engine on the tracks which ran through the center of town in front of the establishment. When a whistle signal from the mill indicated that a load was ready, the bartender's apron was exchanged for an engineer's cap and the saloon-keeper was soon putting on a head of steam instead of a head of foam.

Perhaps it was the traditional cheer of the New Year's season that brought the locomotive "Polly Ann" to one of the most memorable end-



DISASTER came to Number 4 locomotive of Oregon & South Eastern Railroad in 1926 — just as planned. The vintage Baldwin was playing the title role in "The General," a silent movie starring Buster Keaton. Wreck scene took place on a temporary trestle over the Row River, following re-creation of the famous Civil War locomotive chase between "The General" and "Texas." (Below) Number 4 about 15 years before its dramatic end. (Charles Nelson collection)





CHERRY-PICKER, a multi-purpose boom rig, was the pride of C. D. Danaher Pine Co. when first placed in service in 1915. But there were some things it couldn't do, as the inexperienced operator soon found out.



ings of all man-caused accidents. A partner of Guerne & Murphy Lumber Co. decided that blowing up their 2-2-0 would be an appropriate way of welcoming the new year of 1889. Dynamite sticks were placed in the aging locomotive, and as bells, horns and song marked the arrival of midnight, "Polly Ann" took to the air with a blast that sobered the most cheerful merry-maker. Too much dynamite had been used for the event and the lumber company was obliged to replace every window in the town of Guerneville.

High-spirited woodsmen found that horseplay provided a certain amount of release from the rigors of camp life. The engineer of the crummy car was a common target, and he developed skill in avoiding hotfoots, tossed objects and burning gloves. One of the fastest log runs in history was set on the Hobbs, Wall & Co. railroad when a prankster threw a hornet's nest into the locomotive cab of a mill-bound train.

The loggers' humor also showed up in the stories they told about their grim, chancy game with the railroads. A favorite of the bunkhouse was the yarn about Ol' Doc the hogger, who rode out a locomotive which took a flyer off the trestle over Fourth of July canyon. Over and over the locomotive rolled through the timber, carrying the trapped engineer and fireman to inevitable doom. When rescuers reached the smoking locomotive at the bottom of the canyon, they were amazed to see the two men emerge unhurt and smiling.

"A candy run, Boys," the engineer explained. "When she started to roll, I tried to figger out how many times she'd turn over and which way she'd land. I had to throttle her a couple of times to keep her on course, but she landed on her wheels just like I figured, though a big cedar damned near ruined my calculations."

The number of railroad accidents increased as the highball days of logging picked up steam.

Brakemen on logging lines had an accident frequency higher than that of the high climbers, or tree toppers, the latter occupation having been classified by the National Safety Council as one of the five most dangerous in the country. A shortage of fingers became the badge of the brakeman's work as much as it was the sawyer's down at the lumber mill. The cause was not whirring blades but the link and pin coupling.

By 1882, more than 3100 patents had been issued for car-joining devices designed to re-

place the primitive pin type. But it took another five years before the Class I railroads universally adopted an automatic coupler known as the "M.C.B." (after the Master Car Builders).

Everett & Monte Cristo Railroad in 1895 became the first on the Pacific Coast to use automatic couplers on all its rolling stock. E. & M.C. was at that time backed by Rockefeller interests, and could well afford the expensive gesture.

Safety laws notwithstanding, some logging roads used the finger-smashing link and pin method of joining cars into the era of World War II and beyond.

Air brakes were being used by 229 logging companies in 1917, but some lines never bothered to convert from manual braking. One large outfit in Washington kept hand brakes until its line was abandoned in 1958.

In 1905, 22 trainmen were killed and 243 injured on common carrier lines in the State of Washington alone. Most of the fatalities were on log-hauling runs. Logging railroads were considered so dangerous in Oregon in 1915 that the state workmen's compensation act was amended to increase the employer's contribution from three per cent to five per cent of the trainman's wages.

The high costs of carelessness were made evident in other ways. The Washington supreme court awarded a young man \$25,000 for the loss of both legs in a 1913 rail accident. As early as 1899, the heirs a man killed by a Benson Logging & Lumber Co. train received an out-of-court settlement in their \$20,000 suit.

Safety was a long time in arriving in the woods. In 1917, the California Industrial Accident Commission issued a sweeping new set of regulations for the operation of logging roads. Other states followed with similar rulings. Among other requirements, the new laws called for air brakes, guards on the bevel gears of Shay locomotives, fire-prevention devices and two-man minimum crews.

For the most part, the noble regulations for safety were considered flexible, and little effort was expended in enforcement by either railroad operators or the state agencies. Th influence of the railroad brotherhoods was lacking also, as trainmen on logging lines were usually ineligible for membership in the rail unions.

As late as 1952, the California Safety Commission ordered Diamond & Caldor Railway to replace its link and pin couplings with an automatic type. The edict was too much for the little line. Its owners decided to abandon it

instead, and D.&C. went into history as the last common carrier to employ link and pins and one of the few to be killed off by a safety regulation.

Gestures to remind employees that they were engaged in a dangerous occupation were made by some companies. Morrison Mill Co. gave all its employees a life insurance policy for Christmas in 1919. Group life insurance was inaugurated by Brix Bros. Logging Co. in 1922.

Sugar Pine Lumber Co. painted safety slogans on rocks along its railroad right of way which warned "Look Out For Sweepers," "Legs In" and "No Smoking."

Middle Park Lumber Co. placed a white paint mark on the rim of each car wheel so that the train crew could spot a locked wheel when the train rounded a curve.

Starting in the '20's, safety engineers became as important as locomotive and logging engineers on the railroads of large companies.

In later years, operators looked upon their employees more as human beings than as adjuncts to their woods machinery. The attitude found expression in the safety measures that were enforced as much for the welfare of the men as for their employers.

More than anything else, it was the enormous cost of haphazard operations which hastened the adoption of a safety philosophy in the woods. In addition to cash payments to injured woodsmen or the heirs of those less fortunate, there were the expenses of repairing and replacing wrecked equipment, the high price of insurance and the costly down time in woods, mill and on the railroad.

As time passed, the operator realized that he couldn't afford to run a haywire show, and economics once again stepped in to influence the destiny of the logging railroad.



A **TRIO** of wrecked Shays demonstrates that trestles and high water made a dangerous combination. Each of these locomotives was repaired and returned to log-hauling service.



THE SLOW BELL

The editor of *The Timberman* paused to wipe his glasses and stared thoughtfully out the window to the rainy Portland streets below. It was autumn, 1929, and he had just finished compiling statistics for the 1930 edition of *The Directory of the Western Lumber Industry*. While lumber production was off a little from the boom days of the earlier '20's, the editor found optimism in the fact that logging railroad mileage had reached an all-time high.

On the eve of the Great Depression, a thousand steam locomotives were hauling logs on the 7,000 miles of tracks which snaked into the western woods. Three hundred companies operated their own logging railroads. Trackage was increasing at the rate of five per cent a year.

The editor could report to the trade that the typical line had grown to 25 miles in length, with a high average of 45 miles in the sparse forests of Colorado and a low of 18 miles in Oregon and Montana. Some rail hauls approached 150 miles. The 1930 *Directory* would show an average of three locomotives per company, of which two were geared.

The Shays, Climaxes and Heislers were then busy in spur logging. They climbed out on the ridges to pick up cars which had been loaded on the spot with logs yarded not more than a couple of thousand feet away. At the bottom of the spur grade, the cars were switched to the rod locomotive for the main line haul to the mill.

More than half the nation's supply of old-growth timber stood green on the western landscape and *The Timberman* editor shared the hope of his readers that the pattern of highball logging would continue forever.

As *The Timberman* correspondents made the rounds of the camps in 1929, they found an optimism equaling that of the populace in general. Hoover was president. The national purpose seemed to be symbolized by the stock market, bathtub gin and flag-pole sitters.

Thomas B. Walker, president of Red River Lumber Co., was the fifth wealthiest man in the country, and other millionaires were not hard to find in a business which had not stopped

growing for a century. A. H. Fleming of Sugar Pine Lumber Co. donated five million dollars to the California Institute of Technology.

The timber industry had recently climbed to the second largest in the country and the Schafer brothers reflected the western logger's rosy outlook by erecting a neon sign 160 feet long that would be visible to airmen 75 miles away. Lamm Lumber Co. was preparing to send out its traditional Christmas gift of Oregon nuts to its customers.

Thanks to the logging railroad, the West had increased its cut of timber by 200 per cent in 20 years.

Despite the aura of well-being which surrounded Americans in the last years of the Jazz Decade, there were some unhealthy economic symptoms showing up in the timber industry. In the seven years following World War I, more than 3,000 lumber mills in the South had folded for lack of timber. In the West, 29 per cent of the mills were down in 1928 for lack of business.

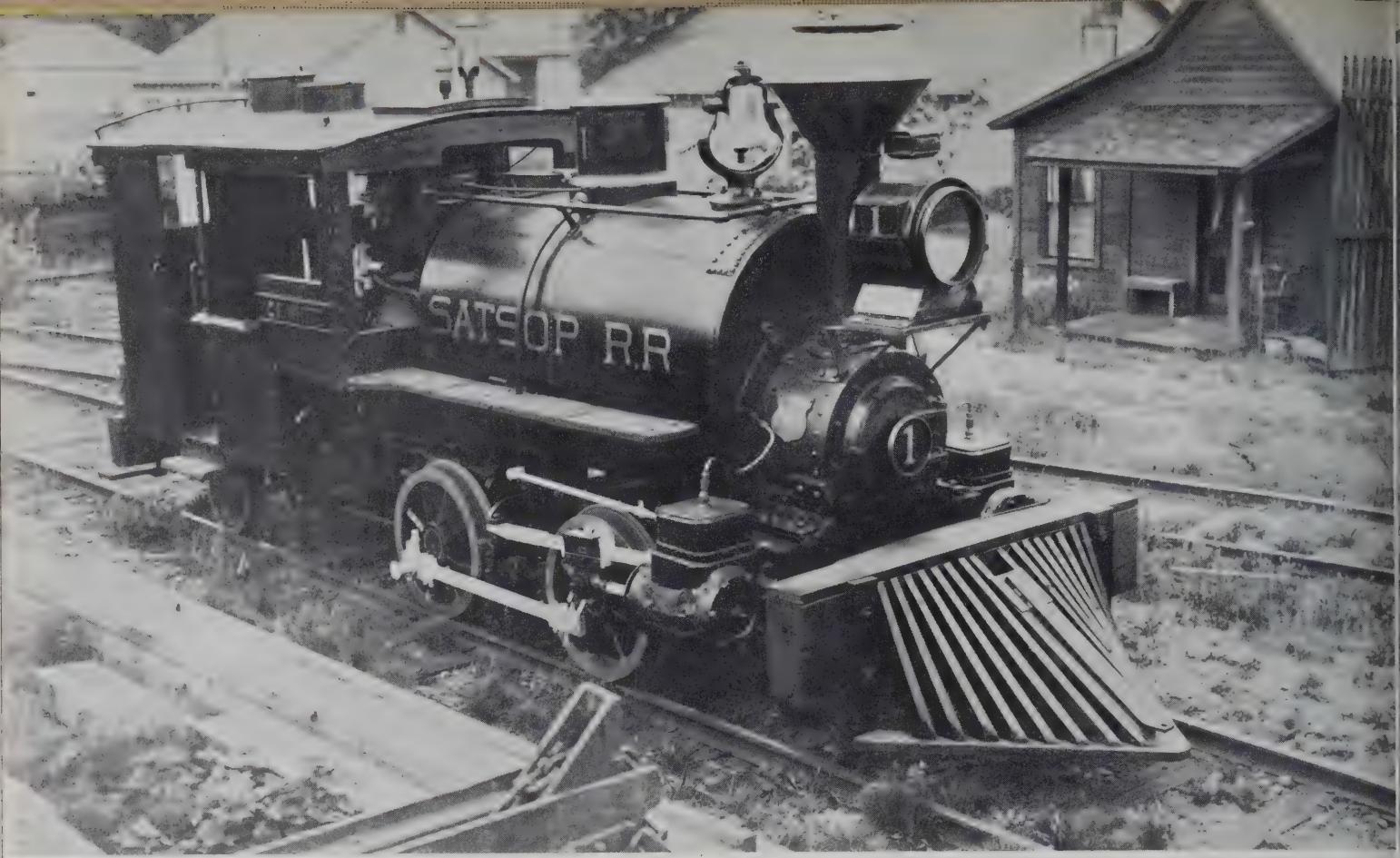
R. A. Long of Long-Bell Lumber Co. assured his associates that "the setbacks in the lumber industry of the last year are no more serious than those depressions which have occurred at intervals during the past 50 years."

When Black Friday hit Wall Street in October of 1929, nearly half of the nation's lumber mills were already idle. Two years later, four out of five mills were down.

The timber industry staggered. As the per capita consumption of lumber slid to an all-time low, logging and lumber companies merged, reorganized, folded. Woods camps were abandoned and padlocks went on the mill gates. In Oregon alone, more than two million acres of forest land became tax-delinquent. The whistle in the woods was heard with decreasing frequency.

Operators consoled each other with such comments as, "I'd burn the mill down, but business is so bad I can't afford the insurance."

The Depression of the 1930's foretold the inevitable demise of the steam logging road and dealt it a near-fatal blow. Small logging opera-



WOOD-BURNING PORTER locomotive was built for Satsop Railroad in 1885. Eventually it was inherited by Simpson Logging Co., which named it "C. F. White" in honor of a pioneer engineer and placed it on display at Camp Grisdale, Wash.

tors by the dozen quietly went under and sold their railroads and equipment for junk.

"The Trinidad," one of the first locomotives to be used in Humboldt County in the '70's, was scrapped and made into steel cables for the San Francisco-Oakland Bay Bridge. Rails of the Filion Bros. line were pulled up and sold to a railroad operation in the Philippines. Like many another operator, Henry McCleary sold his rails to Japan for conversion into steel.

The 100-ton Shay locomotive that sold new for \$20,000, now had a true value of \$5 a ton for scrap.

In 1931, one strapped lumberman advertised his 300-foot steel bridge for sale. The hard-pressed operator who was able to sell off his equipment was among the lucky ones. Others left their steel in the woods to rust.

For a number of years, scarcely a company in the industry could record a profit, and many large woods operations were curtailed in favor of less expensive contract logging. Those operators who managed to stay in business looked around for economical short cuts all along the line.

Sticking out like a sore thumb was the logging railroad. It had gradually developed into the most costly, though necessary, phase of the logging business. It often represented 40 per cent of the cost of logging. But by 1930, a reasonable substitute was available.

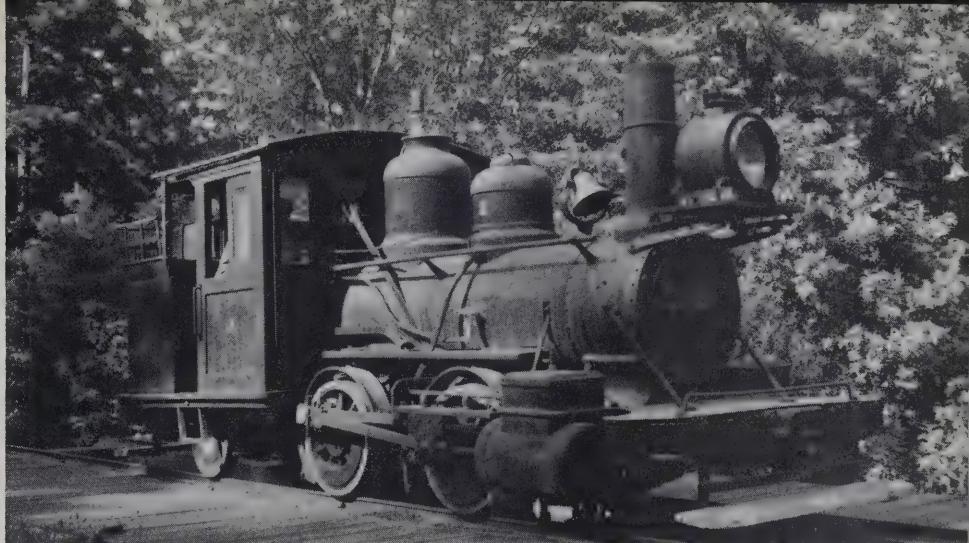
The auto trucks had been clambering around the western woods since 1913. Oscar Lindstrom started the revolution in June of that year when he converted a beat-up Kelly-Springfield bus to a log-hauler of sorts.

The first two-wheeled semi-trailer came along in 1915, the same year that Paul F. Shoemaker of Harris Creek Lumber Company cranked up Idaho's first log truck.

A year later, the Pearce & Balch mill acquired a gasoline lorry and *The Timberman* reported that "other operators are watching the results with interest."

World War I demonstrated the usefulness of the motor truck and stimulated the manufacture of more powerful models. By 1920, the editor of *The Timberman* had been convinced. "The experimental days of the motor truck are behind us," he prophesied, "and a new field

CASPAR, SOUTH FORK &
Eastern Railway's Number 2
was built by Baldwin in the
mid-'80's and is now on dis-
play at Caspar, Calif. (Harold
K. Vollrath)



for their distribution is rapidly opening up."

The editor of the rival *West Coast Lumberman* had to agree. "The logging railroad with its great capacity and low operating expense will always have its place in large operations," he said, "but the motor truck with its less expensive roadbed, lower initial expense, ability to negotiate sharper curves and hence enter rough country for small operations, has become a part of the logging industry to stay."

In these early days of truck logging, only gasoline motors were available, and the unwieldy vehicles remained below the five-ton class. Many of them required plank roads, and some had to be hauled up and down hillsides by cable because they lacked the power or brakes to negotiate the grade.

Rudolf Diesel didn't have the logger's problem in mind in 1892 when he patented his oil-burning engine, but his improvements over the gasoline engine brought another revolution to the business of harvesting timber. In the late '20's, a few loggers were trying out the heavier, but more powerful Diesel trucks for woods chores, causing the editor of *The Timberman* to exclaim, "We are in the wireless and airplane age, and anything is possible!"

By the time the editor compiled his 1930 survey, gasoline and Diesel trucks were hauling about six per cent of the logs which reached the mills. But they were doing it at a lower cost than the railroads, a factor of considerable timelines to Depression-hit timbermen.

Meanwhile, the internal combustion engine had been advancing on the steam locomotive from another direction. First electricity, then gasoline and now Diesel oil had been touted as the coming fuel for logging locomotives. By 1930, a half-dozen other companies had followed Red River Lumber Company in applying Diesel

locomotives to logging work and helped make clearer the shape of things to come.

Of the five basic types of locomotive power now available, the reciprocating steam model was rated fifth and last on the list for thermal efficiency at the drawbar; third in capacity for work; and fifth in over-all performance. The Diesel locomotive ranked higher in all categories.

During the '30's, logging operators here and there hesitantly added a Diesel job to the roster. The initial cost of the equipment was much higher, but the budget-eating, day-to-day operating costs were lower than the steam locomotive. Southwest Lumber Mills found that their new Diesel was using 160 gallons of fuel oil a day, compared with 600 gallons in their Baldwin steamer.

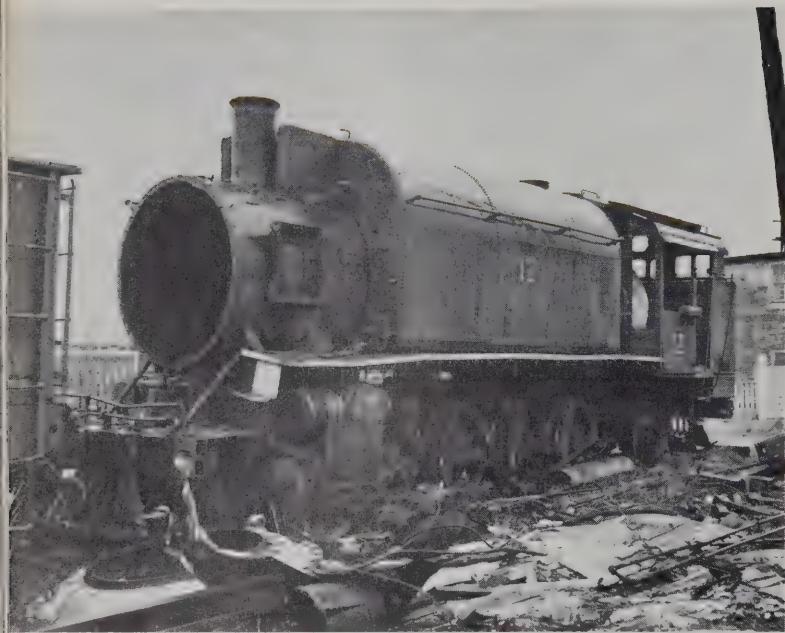
The slow infiltration of the comparatively quiet, glamorless Diesel locomotive was resisted at first by the engineers. "They're trying to turn me into a white-shirted woods chauffeur, and make the fireman a filling station attendant," groused one old hogger, who probably spoke for all the rest.

But sentiment had already lost out to economics. Diesel locomotives, tractors and trucks continued to eat away at the steam logging railroad.

Between 1932 and 1935, the number of logging truck permits in the West had doubled. Before the Depression had run its course, more logs were being hauled to the mills on rubber tires than on flanged wheels.

Other changes were taking place in the woods, too, that would replace the highball with the slow bell.

Timber had become more valuable over the years. No longer could citizens of the West go onto the public domain and legally help themselves to government timber. On patented lands,



the stumppage that was sold in the Nineties for from \$1 to \$20 an acre was worth three, four or ten times that amount in as many years. The first, faint overtures to forestry—protection of the standing timber—were put into practice.

Once logged, the land itself was considered worthless. It was a fire hazard to the surrounding timber and the mounting taxes on it were not worth paying. "The great opportunity in logged-off lands," advised one authority in 1913, "is found in dairying, cattle and hog-raising."

Not a few loggers agreed. Craig Mountain Lumber Company was then clearing its cutover Idaho lands as rapidly as possible and seeding them down in grain. As early as 1891, Occidental Mill Co. was reseeding its cutover to grass, and running cattle which supplied the logging camp with meat. Merrill & Ring Logging Co. was doing the same nearly three decades later. Some redwood lumber companies got together in 1912 and planted 10,000 acres of cutover with apple trees. Many others restocked with Australian eucalyptus. Union Lumber Co. tried walnuts.

Most logging companies attempted to sell off the cutover areas to farmers. Easy payments were available and thousands of "stump ranches" came into existence. Practically no one had yet discovered that most of these logged-off lands could produce only one dependable crop—trees.

As late as 1918, the timber industry was cutting trees four times faster than they were growing them. The planned farming of trees,

as practiced by European foresters, was not yet practical.

A major hindrance to the establishment of good forestry on private lands was high taxes. Much of the early cutover reverted to state and county governments for non-payment of tax levies. Gradually, local agencies came to realize that timber was their golden goose, and anything that encouraged the perpetuation of the forests could produce golden eggs.

Weyerhaeuser Timber Co. hired its first full-time forester in 1924. Two years later, Humboldt Redwood Reforestation Association was able to turn over 9,000,000 seedlings to its members for replanting logged-off land. Larger companies began buying up cutover land instead of trying to sell it. Under the laws of what the forestry schools call economic forestry, timber conservation became practical.

The fast cutting and wasteful timber striping of past years was slowly replaced by timber growing and cropping. The influence of the foresters was being felt and lumber companies adopted slogans like "Timber is a Crop" and "Trees Forever."

New products, and new milling and logging techniques were able to make use of two-thirds of the tree, where at least half the tree's volume was once left to rot in the woods. An old-time trainman reported that "we don't leave enough of the tree back there on the ground to make a woodpecker's lunch."

The new era of woods management made the logging railroad less and less important. In the pine country, Clearwater Timber Co. had pioneered selective cutting, in which only a few mature trees were harvested from each stand. A similar practice was inaugurated in the redwood region. Selective cutting by area, or block logging, came into style in the Douglas fir region. Everywhere in the West, the practice of cutting over large areas was abandoned in favor of selective logging, leaving seed trees and small trees for the future. Without large volumes of logs available in small areas, it became too costly to push railroad tracks into the woods. The more maneuverable truck took over the spur line duties of the railroad.

The first tree farm was dedicated in 1941 on the site of Henry Clemon's old rail show in western Washington.

When war came that year, it brought mixed blessings to the logging railroad. Once again the nation needed timber in a hurry, and the highball days were revived for a final, brief



fling. Gasoline, tires and new trucks were hard to come by, and the few operators who still had railroads patched up their equipment to help turn out a new high volume of logs. But a good many operators succumbed to another appeal to their patriotism. They turned in their old rails, locomotives and logging machinery in an unprecedented flow to the scrap iron furnaces. Among the little-known casualties of World War II were a number of locomotives of priceless historical value. One of these was "The Ant," which had been the first narrow-gauge engine built on the Pacific Coast, the first logging locomotive in the Columbia River area, the first coal-burner in Washington and the first locomotive in the Puget Sound area.

Just before Pearl Harbor, there had been 4,000 miles of logging road in the West, and 500 steam locomotives. Soon after Hiroshima, both figures had been halved. Not a logging railroad

was left in New Mexico, Nevada, Utah or Wyoming in 1947.

Scrap prices climbed from around \$10 a ton in 1942 to \$40 in 1946, making some steam locomotives worth more as junk than as log-haulers.

A favored few locomotives were painted up and sent to foreign lands for industrial uses of various kinds. The nation's only two narrow gauge Mallets were sold by Sumpter Valley Railway in 1947 to International Railways of Central America. Over the years, other logging locomotives had been shipped to Alaska, China, Australia and the Philippines. Some were converted to stationary boilers in lumber mills and one was hauled off to wind up her days providing hot water for a laundry.

Logging costs rose in the post-World War II period, and the marginal railroad operation became sensitive to other pressures. A boiler explosion on Ralph L. Smith Lumber Company's



RESTORED "MINNETONKA" is now used by Northern Pacific for exhibits and special events. NP re-acquired its Number 1 in 1932 by giving Polson Logging Co. an 80-ton freight engine in exchange. (Seattle Historical Society)

line in 1948 took the lives of two trainmen and influenced the decision to abandon railroad operations soon after. The end came for Cowlitz, Chehalis & Cascade when construction of Mayfield dam doomed part of its right of way. Port Angeles & Western Railway folded under the weight of a million-dollar damage suit filed as a result of a forest fire its locomotive may have started. Flood waters from the new Shasta dam closed in on the California, Shasta & Eastern tracks. A lengthy strike of loggers caused the end of operations on the 70-year-old Casper, South Fork & Eastern Railway. Heavy storms of 1948, which washed out trestles, caused Biles-Coleman Lumber Co. to abandon its narrow gauge line.

The need for new highways took a heavy toll and motorists today on many of the West's most scenic routes do not realize that they travel on

parts of old logging road rights of way. Among them are U. S. Highway 34, the main route through the Rocky Mountain National Park, which once supported the trains of Rocky Mountain Railway. Brookings Lumber Co. deeded its old right of way to the county to form a part of the famous Rim of the World Drive in the San Bernardino Mountains. The all-year Feather River Highway runs for a number of miles where the whistles of Sierra Valleys Railways trains once echoed. Intermountain Railway's right of way was sold to the Idaho highway department for \$45,000 and part of the Mt. Baker Highway was originally graded for Allen-Nolte Logging Co. trains.

Some logging lines were abandoned in favor of trucks when it was found that conversion to Diesel locomotives would require the rebuilding of the entire railroad.

The camp cars, coaches, log trucks, crummies and other rolling stock of the logging roads were usually burned to recover the metal for scrap. A notable escapee was "The Potlatcher," a combination car of Washington, Idaho & Montana Railway, which now serves as a concession stand for the Clover 4-H girls of Potlatch.

Some bunkhouse cars were converted to permanent camps. Others were sold for use as summer homes, tool sheds, garages and auto court rental units. One wound up as a tavern on U. S. Highway 97.

Junkers of Cowlitz, Chehalis & Cascade Railway equipment found an unusual buyer for the steel rails. They were shipped to India for use as power poles. The buyer explained that the natives there had a habit of chopping down the wooden ones for firewood.

As the scrapper's torch cut into the dwindling numbers of steam logging locomotives, there were those who realized that efforts should be made to preserve a few of the prime symbols of logging's highball days.

Northern Pacific Railway made the first move. Chicago's Century of Progress Exposition was coming up and NP looked around for its first locomotive, "The Minnetonka," for an historical exhibit. As rumored, the 1870 model Smith & Porter was rusting away in the woods of western Washington. After serving NP for 16 years in construction work on both sides of the Rockies, Number 1 had been sold to Ainsworth & Simpson Lumber Co. and then to Port Blakely Mill Co. It was bought in the '90's by Polson Bros. Logging Co., and hauled logs until 1928, when it was abandoned in the woods near Hoquiam. "Ol' Betsy," as the Polson loggers called the little 10-tonner, had put in 58 years of hard service. Things were slow in the lumber business in 1932, and the Polsons jumped at the opportunity to trade a worn-out "Betsy" even up for NP's Number 51 consolidation type locomotive.

Completely reconditioned and restored to Number 1 on NP's roster, "The Minnetonka" became a popular attraction at the Century of Progress, the New York World's Fair and the Railroad Fair. The Cinderella locomotive, equipped with a loaded log car, has been assigned to permanent exhibit duty and now makes the rounds of civic celebrations along the NP line.

Number 1 of Mattole Lumber Co. had received considerably worse treatment than "Ol' Betsy" before she was discovered in 1950 rust-

ing away in a river bed. Gus Haggmark and Henry Sorensen bought the half-buried Vulcan product for \$1, restored it, and now run the little 0-4-0 on their private line near Eureka.

In his youth, Weaver Clark had worked for Oregon-American Lumber Co., and when the old mill was closed in 1957, he asked the manager if he could spend 15 minutes wandering around the place with his memories. The nostalgic moments had a strong effect on Clark, and he was soon back in the manager's office writing out a check to buy the company's two prairie-type locomotives. They are destined for eventual exhibit.

Other sentimentalists have helped save the steam logging locomotive from oblivion. Pioneer Box Company's 0-4-2 tanker was bought by Robert Day and now rests in the Santa Fe roundhouse at Los Angeles. The members of Puget Sound Railway Historical Association have picked up a number of woods locomotives for their three-quarter-mile excursion line near Snoqualmie Falls. C. O'Connor of Pasadena bought Rogue River Valley Railway's Number 2 locomotive. Hobart Mills Number 5 Baldwin is occasionally seen in a Warner Bros. movie or television production.

The logging companies themselves have made the greatest effort to preserve memories of the past. They have contributed most of the locomotives now on permanent display.

Perhaps the best collection of old woods locomotives will be found in the proposed transportation museum to be located near the maritime museum in San Francisco. Scheduled for display are locomotives once owned by Dollar Lumber Co., Lorane Valley Lumber Co., and Hobart Mills.

The derailment of Number 7 Mallet which ended rail operations of Deep River Timber Co. in 1955 brought good fortune to a group of rail fans in Seattle. The 1909 model Baldwin had been turned over to an insurance company for salvage, and Charles Morrow was able to buy it "as is, where is," for the scrap price. The bargain was not without its problems, however. The timber company tore up the tracks soon after the wreck, leaving Number 7 stranded on her side in the woods. To remove it, the amateur railroaders in 1960 had to cut up the 120-ton locomotive into pieces and haul it out by truck. Looking over the parts scattered on the ground, Morrow commented, "This is probably the only do-it-yourself locomotive kit in history."

Another stranded locomotive moulders in



SHAY NUMBER 4 of Diamond & Caldor Railway crossed this bridge over the Consumnes River uncounted thousands of times in its half century of service. The two-truck, narrow-gauge locomotive was donated to the El Dorado County Fair in 1953 and is now on exhibit at Placerville, Calif.

the woods of Humboldt County, cut off by a fire in 1945 which burned out a series of trestles. Hammond Lumber Co. decided that the railroad was not worth rebuilding and left the rod locomotive standing on the isolated section of track. A few rail fans know its location and have made efforts to protect the orphan for what they hope to be eventual rescue.

In spite of their worthwhile efforts, the historical societies, rail fans and lumber companies have managed to save a ratio of only one in 50 of the locomotives that served in the western woods. Forty of these are now on permanent display and another dozen or so are awaiting relocation to some type of exhibit.

Fewer than 30 steam locomotives remain in use or capable of use in the early 1960's. A third of them are owned by Rayonier, Inc., the last of the great steam logging railroad operations.

Running on Olympic Peninsula rights of way that were originally put in by a half-dozen predecessors, the well-kept Rayonier steamers seem destined for a long life to come.

Rayonier's last spur logging operation, in which the cars were loaded at the felling site, took place in 1957. Medford Corp. operated the last all-steam rail show in the West until the spring of 1959. Logs were yarded to a McGiffert loader for placing aboard the cars and then taken down the spur by a Shay and on the main line to the mill by a 1924 model Baldwin 2-8-2. The old type of spur yarding-loading operation is still practiced occasionally at Weyerhaeuser Company's Klamath Falls branch, but Diesel equipment long ago replaced steam.

"We just can't afford spur logging anymore," said the woods boss of one remaining rail operation.

For the optimistic, there were a few straws to grab in steam's waning years. Craig Mountain Railway retubed its Heisler in 1956. Longview, Portland & Northern Railway retubed its Number 680 Baldwin consolidation in 1957. Paramount Pictures in 1956 put a new boiler in its narrow gauge relic that had once hauled logs for a living. The Shays operated by Klickitat Log & Lumber Co. are given a steam bath at the end of each day's run. Mr. Styles of Railway Equipment Co. in Portland reports that he maintains a large stock of steam locomotive parts.

Weyerhaeuser Timber Co. opened up its Springfield operation in 1949 and built a brand new railroad system to provide it with logs.

"Don't go around knocking our pike as a 'quaint anachronism,'" warned a college-educated woods boss recently. "This will be a railroad show as long as the timber keeps growing and until trucks or helicopters can make our long-run haul more cheaply. And that could be a long time."

An engineer who pilots a Rayonier steamer on its daily run is fond of saying, "I ain't bought any white shirts yet to wear on a Diesel."

But behind the bravado, time is running out. Each economic recession of recent years has brought the end of more logging lines, the disposition of additional locomotives. The steel strikes of the '50's placed a premium on scrap and decimated the steam rosters.

The last Brooks locomotive made its final run on the Harbor Plywood line in 1957. The last Schenectady in logging service made the run to limbo in 1959. The last of the steam loco-

motives that hauled logs for Northern Pacific was scrapped at Tacoma in 1960. The fire went out in the last Cooke product in 1961.

On the anniversary of western steam logging's 92nd year, Metro-Goldwyn-Mayer sent Georgia-Pacific Corporation's last active steamer to a spectacular end at the bottom of a canyon for a scene in the movie, "Ring of Fire."

By 1961, Editor William S. Young of *Short-Line Railroader* could report that there were less than 50 Shays left in North America. Of the hundreds of Climaxes which snorted through the western forests, not one was available for service.

Today a graduate forester edits *The Timberman*, and the annual summary of logging railroads is no longer worth compiling. Of the 3,000 different log-hauling lines that sprouted between the trees, less than three dozen remain. The 7,000 miles of track that crawled through the pines, firs and redwoods in 1930 has dwindled to less than 1,000. Spur logging is dead. Young trees grow between the rotting ties.

Gone are the Knothole Central, the Wooden Axle Southern, the Dutch Pacific and their counterparts in all the western states. Gone too are most of the woodsmen who named them and teamed with the little railroads to harvest the greatest crop of logs in history.

The logger's beloved steam pot has clanked her way to oblivion—victim of a new philosophy of woods management and the devastatingly efficient engine of Rudolf Diesel. Progress has reduced to a memory the sound of the steam whistle in the woods. The highball days have come and gone.

ABANDONED machine shop of Schafer Bros. Logging Co. resists for awhile the encroachment of weeds, trees and time.





OLD NUMBER 7 of Klickitat Log & Lumber Co. still makes a daily log run up and down the Klickitat River canyon in Washington. The 90-ton Shay is given a steam cleaning each day. (Henry R. Griffiths, Jr., photo)

LOCOMOTIVE NUMBER 3 of Medford Corp. still makes an occasional run into the pine forests of southern Oregon. The Mikado type 2-8-2 was built by Baldwin in 1924 and now serves as relief to the company's Diesel locomotive.



TWO-TRUCK SHAY once used by Oregon-American Lumber Co. has been placed on display at Vernonia, Ore., by Long-Bell Division of International Paper Co.





TRESTLE OVER TEN CREEK was built by Snoqualmie Falls Lumber Co. in 1921. Decaying remains were photographed again in 1944. Trees have since grown so large that the site is unphotographable.





NUMBER 7 of Deep River Logging Co. was one of the first Mallets built in America. The 1909 model Baldwin derailed in 1955, bringing the decision by Deep River to abandon its railroad operations. Railfan C. G. Morrow bought the distressed locomotive "as is, where is," and planned to display it in a rail museum at Snoqualmie Falls, Wash.





4738. W.T.C. VAIL, WASH.
IMBER VIEWS CO., Seattle FEB. 1938.

LOCOMOTIVE ROSTER of Weyerhaeuser's Vail logging operation in 1938 consisted of a magnificent array of steam power. Number 103 was a Baldwin Mikado of 86 tons built in 1913. Three Mallets, two Shays and another "Mike" are also in the line-up.

TAKING ON WATER near Hambone is a double-header of Prairie type locomotives of McCloud River Railroad. One of these 2-6-2's still makes an occasional log-hauling run.





WHISTLE SIGNALS

The State Safety Board of Washington in 1920 issued an order to standardize locomotive whistle signals on logging lines. They are similar to those used elsewhere and on mainline railroads.

(0: short; -: long.)

0 stop; apply brakes

00 answer for any signal not otherwise provided for; (highball)

-- release brakes, proceed

--- when running, train has parted

0 0 0 when train standing, back up

-- 0 0 approaching highway crossing at grade

----- approaching stations, rollways, chute crossings, junctions and derailers on the main line

0 0 0 0 air brake sticking

A succession of short sounds of the whistle is an alarm for persons or livestock on the track.

A Personal Note

The steam logging railroad has many friends. They have been discovered in all the Western states covered by this book, and in a number of less-fortunate locations as well. Among them are the old-timers who recall the days when the steam whistle was the heart-beat of the woods. They include historians, editors and librarians who have never been aboard a trainful of logs. Other dedicated supporters are found among the rail fans who have salvaged valuable bits of information from the maw of time. All admit to the charge of being unashamed sentimentalists.

'If you're going to write a book on logging roads,' one old-timer advised, 'you can't lie fast enough to keep up with the honest facts.'

The woodsman's comment was a fair assessment of the nine decades of western railroad logging. Keeping up with the honest facts required assistance from many quarters.

The list of contributors to this book must begin with co-worker John Blake. Several years ago, he was unable to find adequate reference material for a railroad story planned for *Weyerhaeuser News*, forcing us to agree that this book should be written.

Stewart Holbrook, Jim Stevens and Dr. Donald Clark, each an author much better qualified to tackle the subject, offered early encouragement. Indeed, they have involuntarily contributed in more tangible fashion by compiling information in their own works which has been reproduced herein.

Editor Freeman Hubbard of *Railroad Magazine*, Lucius Beebe, George Abdill, Russel Lynes and Friend John Wesley Noble are other by-liners who lent a hand when most needed.

At the risk of name-dropping, let credit be given also to the greats of the timber industry, such as Arch Whisnant of the Pacific Logging Congress, Thornton Munger, Hal Ogle, Tom Murray and Ted Gilbert.

This book's Who's Who is a fortunate one, including as it does Le Von Dunford of Southwest Forest Industries, Bob Lee of Georgia-Pacific Corp., Jim Durgan of St. Regis Paper Co., Tom Mutchler of International Paper Co., Alden Ball of The Pacific Lumber Co., Dave James and Oscar Levin of Simpson Timber Co. and Allen C. Smith of Medford Corp.

The patient people at Weyerhaeuser Company who indirectly served the reader include Vic Tennant, Jay Gruenfeld, Tom Orr, Art Smyth, Ted Durment, Phil Hogan, Al Johnson, Ed Mathewson and the late Byron Oyster. Artist Dick Londgren accurately reproduced the logging road insignia which decorate the end sheets.

Essentially every photograph on railroad logging in the files of the U.S. Forest Service was made available through the diligence of Public Information Director Clint Davis. The same generous overture was made by Mac Eppley of Western Pine Association, Bob Mahaffey of West Coast Lumbermen's Association and Phil Farnsworth of California Redwood Association.

John C. Kosky of Baldwin-Lima-Hamilton turned his office upside down to provide photos and information for this project, as did Elwood

Maunder of Forest History Society and Ralph Bell and James K. Gibson of California Public Utilities Commission.

This essay turned out to be a better one for the cooperation of Joseph C. Larin, J. C. Rutledge, Albert Farrow, Jim Gertz, Ray Nelson, Professor Jonas Jonasson and John T. Labbe. Editors Al Arnst of *The Timberman* and Donald Duke of *Pacific Railway Journal* were also helpful.

Cumulative credits go to many courteous people in our libraries across the land, from Ed Maconomy at the Library of Congress to Richard Berner at the University of Washington. There was Miss Mary Kobitich at the Tacoma City Library, Miss Alta West at the Washington State Historical Society library and Mrs. Frances Buxton of the California Room at the Oakland Public Library.

Miss Nancy Hacker and Tom Vaughn of the Oregon Historical Society performed beyond the call of duty, as did W. B. Beatty of Amaragosa Memorial Library and Mrs. James G. Maple of the Coos-Curry Museum.

A trio of experts nearly became co-authors. The help of Nannie Escola of Mendocino, Calif., Chaplain Homer Benton of the U.S. Army and Jack Slattery of Jack's Photo Shop in Coos Bay, was invaluable.

The author hesitates to list his mother as a contributor to the book, lest it seem a bit of gratuitous sentiment. Yet the many months of tedious research accomplished by Mrs. Maynard Fraser in the California libraries cannot pass without written acknowledgement.

While it took many people to provide the information for this essay, the author alone assumes responsibility for the inevitable inaccuracies which time is bound to discover. The very reason for this book, a lack of organized information on the subject of railroad logging, may account for some factual shortcomings.

Publication has been delayed in order to conduct a second search for printed materials which might provide clues to long-vanished logging pikes. At press time, there was reasonable belief that every available printed source had been consulted in the compilation of the appendix listing.

There may be some raised eyebrows among fellow rail fans over the labeling of certain railroads as logging lines, just as there may be over the exclusion of certain others. From the beginning of this project, only those roads have been considered whose traffic at some period was 50 per cent or more in logs. Lumber-hauling lines have been eliminated, as have the big mainline railroads and their subsidiaries.

The friends of logging railroads were found everywhere, and many of them cannot be listed here. To all the contributors, and especially to the woodsmen of the West's highball days who made a story worth telling, this effort to record a fading era is respectfully dedicated.

GLOSSARY

The jargon of the railroader is a formidable collection of expressions which has been accumulating since railroading began in the 1830's. But it is no match in size, color or profanity for that of the logger. Practitioners of the two occupations find cause for mutual respect and admiration in each other's language.

As true connoisseurs of the colorful word, loggers adopted many of the railroaders' terms for their own. The influence was apparent in such expressions as "standard gauge," which came to mean anything that met with the logger's pleasure, and "short of cars," which described a state of unemployment.

"Highball," originally a railroad signal ball raised and lowered on a mast, became the short, double-whistle signal for "let's go," and still later, meant a fast, often careless logging operation where forest conservation practices went unheeded.

"Pull the pin," is generally understandable today as a term for departing from the scene. It came from the act of removing the securing pin in the old link and pin coupler on railroad cars. "In the clear" and "pull freight" are other loggerisms borrowed from the railroadeese.

Further evidence of the linguistic melding include such terms as:

Balling the jack—highballing a logging locomotive.
Boomer—migratory railroader or logger.

Count ties—to quit or be fired from a logging camp.

Crown sheet—flapjacks bearing bubble holes similar to those in a locomotive crown sheet.

Dump the pan—to discard or spill something, as the engine crew did when ridding the locomotive ash pan of its fire.

Fire box—a logger's stomach, particularly after a week-end in town.

Has his head cut in—straight-thinking man who is as much under control as a train with its air brakes cut in.

Hole in the boiler—ulcer or stomach ailment.

In the rip track—man hospitalized.

Rolling stock—doughnuts.

Side rod—loading foreman of a jammer; an executive assistant.

String of flats—stack of hotcakes, after a train of empty flat cars.

The following glossary of railroad logging terms is, unfortunately, incomplete. The reasons are both spatial and esthetic. Dean Walter McCullough, doing research for "Woods Words," published by Oregon Historical Society in 1957, came across more than 5,000 distinct terms used in the western timber industry. Many more of the woodsman's expressions were supremely descriptive, but equally unprintable.

Some of the woods words below come from Dean McCullough's book, as well as Wilbur A. Davis' "Western Folklore," and "Logger's Lingo," a study by American Forest Products Industries. The following compilation owes much to these sources, as well as to numbers of anonymous and unsuspecting verbal contributors.

ENGLISH-LOGGER'S DICTIONARY

BRAKEMAN—Casey Jones, pin head, iron bender, donicker, ground hog, block head.

CABOOSE—zoo, parlor, hut, coop, brain wagon, cage, hack, hearse, kitchen, louse cage, shack, shanty, ape wagon, crummy, bouncer, buggy, chariot, dog house, hay wagon, cabin car.

CONDUCTOR—con, skipper, crumb boss, shack; senior conductors rode the caboose as hind end shacks while their juniors rode swing shack in the middle of a long log train or the smoky end at the locomotive.

CREW CAR—crummy, galloping goose, skunk, doodlebug, mulligan, speeder.

DISPATCHER—train delayer.

ENGINEER—hogger, Casey Jones, eagle eye, runner, log hauler, throttle jerker, hoghead, lokey puncher.

ENGINE HOUSE—pig pen.

FIREMAN—tallow pot, fireboy, bakehead, greaseball, smoke boy.

FLAGMAN—parlor boy.

FORESTER—fern hopper.

LOCOMOTIVE—jack, lokey, hog; iron ox (early usage); mill, pot, boiler and coffee grinder for old or troublesome models; dinky, goat and tea kettle for small ones.

LOG POND—drink, dump, booming grounds.

LOGGING ENGINEER—scenery inspector or S.I.

MECHANIC—nut buster, nut splitter, hostler; his boss was the "master maniac" (mechanic).

RAILROAD—pike, peavine, track.

REPAIRMAN—car knocker, car toad, tinkerer, car whacker.

SPARK ARRESTER—(smokestack device to prevent spewing of sparks) bird cage, balloon, spark cap.

SWITCH ENGINE—shifter, switcher; in the woods a goat.

SWITCHMAN—snake.

TURNTABLE—merry-go-round.

LOGGER'S - ENGLISH DICTIONARY

ADVERSE—uphill railroad grade.

AIR ARTIST—locomotive engineer skilled in using air brakes.

BALD WHEELS—locomotive driving wheels with flanges removed to help prevent derailments; also blind tires.

BALDFACING LOGS—loaded log cars being pushed by locomotive at rear.

BAKE A CAKE—to get up steam; also to get her hide tight.

BEAT THE THROTTLE WITH A STICK—full speed; same as fogging (with steam); also widen on 'er.

BARNEY—power car on an incline railroad.

BEND THE IRON—to engage a switch.

BOARDING CAR—a railroad camp cookshack on wheels.

BONE YARD—end of the line for rolling stock; also rip track, scrap track, dead line.

BROKE—past tense of the verb “to brake,” as “He broke (served as brakeman) on a logging pike.”

BROWNIE—demerit mark assessed for rule infraction.

BUNK—the part of a logging car or truck upon which logs rest

CANDY RUN—short or easy haul; gravy run.

CHANCE—logging show, or operation; a railroad chance was one using railroads, while a summer chance was one loggable only in good weather.

CHERRY PICKER—car-mounted crane used to lift logs and equipment which was developed by Ronald McDonald when he was the woods boss at Cherry Valley Logging Co.

CLEAN THE CLOCK—to cause the brake pipe pressure gauge needle to drop to zero when brakes are applied suddenly.

COMPANY NOTCH—that point on the locomotive throttle which gives the most pulling power with greatest efficiency.

DECLINE—(opposite of an incline) method of hoisting loaded log cars by cable up steep grades.

DINKEY-SKINNER—mainline engineer's description of a logging road engineer.

DRUNKARD—the loggers' passenger train returning to camp from a night or a week-end in town.

DYNAMITE 'ER—to stop suddenly; plug.

GANDY DANCER—railroad section worker; one who hides gravel under and around the ties following ballasting; steel man.

GRADE DESTROYER—log car with a bulkhead at one end to prevent loss of logs on incline railroads.

GYPSY—locomotive equipped with steam-powered winches used to bring in logs; a donkey rig built onto the locomotive pilot.

HIT THE PIKE—head down the railroad track toward town; also hit the steel; mix me up a tie pass.

HODAG—legendary beast of the woods; a fearsome animal whose deeds were often recounted to impressionable young scissorbills.

HOMESTEAD—to jump off a runaway train; also hit the brush, unload or join the birds.

HUMPBACK—piece of metal which was spiked to the ties and used to guide the wheels of a derailed car back onto the tracks.

INCLINE—method of lowering loaded log cars by cable down grades too steep for locomotive power.

JACK SCREW—large hand-operated jack used to move logs before steam machinery came to the woods.

JAMMER—log loading machine which straddled the tracks, taking in empty cars at one end and disgorging loaded ones at the other; a slide-s jammer was a loader which moved along the top of empty flat cars on temporary track.

JILL POKE—sturdy pole with many applications in logging, one of which was to shove cars from a siding when no locomotive was available.

KING SNIPE—the steel gang boss.

KINK—section of poorly ballasted track warped by the sun.

LIDGERWOOD—car-mounted, steam-powered log loader and skidder which first appeared in 1882.

LINK-AND-PIN—primitive car-coupling method which caused many injuries to trainmen; also Lincoln pin.

LOCOMOTIVE CORD—stack of wood for locomotive fuel cut in two foot lengths and piled four feet high and eight feet long.

LOG JAM—results of a log train mishap.

LOWERING RIG—engine operated by steam, air or hydraulics to raise or lower log cars on an incline.

MAINLINER—logging locomotive engineer who handles his engine and himself as if they were on the Southern Pacific; a hot-rodder.

MAIN LINE—permanent, basic trackage of a logging road, as opposed to the branches and spurs which were usually removed as logging progressed; main gut; also used to describe large common carrier railroads.

McGIFFERT—track-straddling jammer or loading machine used in pine logging; a skidder employing booms for loading logs on cars at both ends.

MULLIGAN—rail vehicle used to haul woods crews to and from camp; originally the car which brought hot meals to the woods, and labeled for the frequent delivery of stew, or mulligan.

MUZZLE-LOADER—rail camp bunkhouse car with one door at the end.

NIPPER—steel gang worker who holds up ties being spiked to the rail.

NORTON JACK—hand-operated jack used in moving logs and rerailing cars.

PARBUCKLE—method of loading logs onto cars by employing a cross-haul line under the logs which, when pulled by the locomotive, started the logs rolling.

PONY EXPRESS—rail speeder which brings mail to camp.

POUNDING THE SCREEN—getting a better draw for the locomotive fire by hitting the spark arrester and shaking loose the collected carbon.

RELAY—rail that has been used and relaid in a new location.

ROCK—low grade coal for locomotive use; also known as “real estate.”

SCISSORBILL—student switchman or greenhorn in the woods.

SHOW—any logging operation or chance.

SIDE—complete logging operation, which may contain more than one setting.

SETTING—logging operation and equipment within yarding distance of a spar tree or loading machine.

SHOO-FLY—detour built around a slide, wreck or other obstruction; a route which winds around the hillside instead of employing a trestle or fill across a canyon.

SKELETON CAR—log carrier with frame in the form of a capital “I.”

SMOKE SIGNALS—the only way for the engineer to determine if another train was ahead on many logging lines; operating a train without proper orders.

SNIPE—beveling of log ends to aid skidding over obstructions or on the ties when trailed behind a locomotive.

SWITCH BACK—zig-zag railroad route built to overcome a grade too steep for direct ascent.

TRAILER—flat car pushed ahead of the locomotive to couple onto cars located on track unsafe to permit passage of the locomotive.

WANIGAN CAR—timekeeper's headquarters and office car of a railroad camp.

WEAR A FEATHER—plume of steam coming from a locomotive safety valve which is blowing off.

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APPENDIX

Logging Railroads of the West

It's often easier to retrace the right of way of an abandoned logging road through the second growth than it is to track down its vital statistics. Some of the log-haulers steamed into history with no printed evidence of their existence. Only a few of them reached that status which required reporting to a governmental agency.

The listing that follows represents the best available information from such sources as state railroad and tax commissions, locomotive sales records, contemporary publications and interviews with veterans of the highball days. The prime source has been the annual directories of railroad and logging companies issued by Abbey, *American Lumberman*, Moody, Poor, *The Timberman* and *West Coast Lumberman*.

Where possible, the location indicated is the site of the logging camp. Where there was more than one operation or where the logging site is not locatable on a modern highway map, the nearest town is given. Usually the town is the mill or railroad headquarters.

The same standard which was used in the selection of photographic and textual material applies: the railroad must have carried more logs than other freight or passengers for a substantial period. Many mill-owned lines which hauled lumber have thus been eliminated, though a few no doubt persist due to the inability to determine from this distance in time whether the railroad was coming or going in relation to the mill.

The railroad operations listed in capital letters are those in existence at press time. They are main line log-haulers which pick up loaded log cars from truck reload points. In most cases, these roads have been Dieselized. In a few cases, they have become mill-switching, lumber or freight lines.

The figures concerning mileage and numbers of locomotives are the highest of record, and do not necessarily indicate the extent of the operation for the last date given.

The dates represent the start and end of railroad operations, not necessarily the life of the parent company. Dates in parentheses are the earliest or latest of record.

Where a railroad operation was owned by another company, the owner is listed in parenthesis. Subsidiary and predecessor companies are listed in descending order below the parent or surviving organization.

Railroads having gauges less than the standard four feet, eight and-a-half inches are listed in bold-face type.

Abbreviations are as follows:

L—Lumber	M—Mill	g—geared
Lg—Logging	T—Timber	r—rod

CALIFORNIA

Name	Location	Mile- age	Locomo- tives	Dates	Name	Location	Mile- age	Locomo- tives	Dates
Albion L Co. (22)	Albion	30	2g 2r	(1902)-1934	FEATHER RIVER RY (Georgia-Pacific Corp) (Feather River Pine Mills) (Hutchinson L Co)	Feather Fls	32	5	1923-present 1955-present
Pacific Coast Redw L Co	Albion			-1920	Fibreboard Corp	Hobart Mills	7		1927-1955
Navarro L Co	Navarro	7	2g	1913-1920	Finkbine-Guild Co	Rockport	2		1923-1927
Stearns L Co	Wendling	5	1g 1r	1905-1913	New York & Penn Redw Co	Hardy	5	2g	1926-1931
Albion & Southern RR	Albion	25	3	(1910)	C A Hooper & Co	Hardy	3	2g	1907-1911 (1886)-1907
Albion & Wetherbee Co	Albion	10		1880's	Hardy Crk & Eel Riv RR (28)		5	1	1907-(1912)
Albion River RR	Albion	7	1r	(1887, 1889)	Ft Bragg & Southeastern RR	Albion	15		1903-1907
Alpine L Co	Santa Clara	2	1r	1908-(1912)	Albion & Southeastern RR	Albion			1902-1903
Amer Fruit Growers Inc	Macdoel	8		1920-1922	Ft Ross L Co	Ft Ross	1		(1910)
Dwinnel L Co	Macdoel	8		1919-1920	Forward Bros L Co	Manton	3		(1941)
Anderson & Middleton L Co	Bear Harbor	36		1902-(1904)	Chas H Fowler & Co	Grass Valley	2		(1910)
ARCATA & MAD RIVER RR (2)	Arcata	35	6	1902-present	Fruit Growers Supply Co	Hilt	50	4g	1913-1953
(Simpson T Co)				1960-present		Susanville	35	3r	1921-1953
(Simpson Rdw Co)				1957-1960	M C Gardner	Cp Richrdsn	40	2r	1875-1885
(Northern Rdw Co)				1903-1957	GEORGIA-PACIFIC CORP	Samoa	31	2g 4r	1956-present
(Humboldt L M Co)				1883-1903	Hammond Redw L Co	Samoa	48	13	1936-1956
Arcata Transportn Co				1881-1902	Humboldt Redw Co	Carlotta	5	2g 1r	1929-1937
Union Plank Walk Rail				1875-1881	Bayside Redw Co	Eureka	5	2g 1r	1920-1929
Track Co (6)					Bayside L Co	Eureka	9	2g	1900-1920
Bear Harbor RR	Mendocino Cty			(1905)	Hammond & Little River	Crannell	80	4g 3r	1931-1936
Arcata M & L Co	Arcata	1	1	(1887, 1889)	Redw Co	Crannell	18	4g 2r	1908-1931
Bendixen Shiplbdg Co (23)	Eureka	2		(1908, 1910)	Little River Redw Co	Crannell	30	3g 3r	1912-1931
Bree & Smart (24)	Emigrant Gap	7	1g	(1905, 1910)	Hammond L Co	Samoa	20	1r	1900-1912
N J Blagen	Calpine			(1923)	Vance Redw L Co	Samoa	7	1r	1886-1900
Blue Lake Lg Co	Blue Lake			1928-1929	John Vance M & L Co	Samoa	47	9	1903-1911
Bodie & Benton Ry	Bodie	40	4r	1881-1918	Oregon & Eureka RR (29)	Eureka			
(Mono Lake L Co)				1908-1918	Eureka & Klamath Riv		35	6	1896-1903
(Bodie Ry & L Co)				1856-1908	RR				
(Bodie & Benton Ry & Comm Co)				1882-1836	Humboldt Bay & Trinidad RR	Vance	13		1892-1896
(Bodie Ry & L Co)					Humboldt Bay & Trinidad Lg & L Co				1891-1892
Brookings L & Box Co	Highland	10	2g	1881-1882	Humboldt Bay & Trinidad Lg & L Co				
M A Burns Mfg Co	Eureka	20	2g	(1899)-1912	Humboldt & Mad River RR	Vance	12	3r	1875-1891
Butte & Plumas Rx	Oroville	25	4	(1932)	Humboldt Northern Ry	Samoa	20	2r	1905-1958
(Swayne L Co)				1902-1939	(Hammond interests)				1931-1956
(Truckee L Co)				1917-1939	(Little River Rdw Co)				1925-1931
Oroville & Plumas Ry				1902-1917	(Dolbeer & Carson L Co)				1905-1925
Calif Barrel Co	Arcata	6	1g	1916-1941	Carson Ry Co				
(Koster Products Co)					Glynn & Peterson M & L Co	Del Mar	3	1r	(1907, 1910)
Humboldt Cooperage Co					Goodyear Redw Co	Elk	40	3g 1r	1916-1935
Calif Door Co (25)	Diamond Spgs	12	3g	1913-1918	L E White L Co	Elk	22	2g 3r	(1887)-1916
Calif Fruit Exchange	Graeagle	15	1r	1919-1937	Salmon Creek RR	Whitesboro	10	2r	(1884, 1889)
Davies Box & L Co	Blairdsden			1916-1919	Greenwood RR Co	Greenwood	16		1890-(1908)
Calif Midland RR (16)	Burnells	4		1902-1903	Elk Creek RR	Elk	25	2g 3r	1889-(1912)
Calif Peach & Fig Growers Assn	Mather	5	2g	1918-1926	Mendocino RR	Greenwood	4	2r	1876-(1888)
Calif Tie & T Co	Pescadero	1	1	1929-1933	Graeagle L Co	Blairdsden			(1916)
Calif T Co	Bouldr Crk	7	1r	(1907, 1910)	Grizzly Creek L Co	Castella	1	1g	1921
Campbell Redw L Co	Pescadero			1917-1918	Guadala River RR Co	Cazadero	15	1r	1891-(1908)
Canby RR Co	Canby	20	3g	1929-1948	Hassler L Co	Hobart Mills	7		1950-1951
(Ralph L Smith L Co)				1943-1948	A Haun & Sons	Branscomb	1	1r	(1908)-1924
(Big Lakes L & Box Co)				1937-1943	Heim L Co	Laytonville	1	1	(1941)
(Walker-Hovey Co)				1929-1937	J C Hickman & Son	Annapolis	2		(1910, 1912)
Caspars L Co	Caspar	30	2g 5r	1876-1946	F A Hihn	Loma Prieta			(1880's)
Caspars, South Fork & Eastern Ry	Caspar	14	4	1876-1946	Hobart (Estate) Mills (7)	Hobart Mills	32	3g 2r	1918-1936
Caspars & Hare Creek RR	Caspar	8	2	1884-(1889)	Sierra Nev Wood & L Co	Hobart Mills	28	1g 7r	1896-1918
Castle Crag L Co	Castella	16	2g	1920-1936	Hobart Southern RR	Hobart Mills	7		1930-1935
M A Burns L Co	Castella	30	2g 1r	1911-1920	Hobbs, Wall & Co	Crescent City	20	1g 6r	(1887)-1940
Chandler, Henderson & Co	Blue Lake	1		(1884)	Del Norte Southern RR	Crescent City	8	1g 6r	1912-1925
Charles L Co	Boonville	8		1952-1957	Crescent City & Smith River RR	Crescent City	17	4r	(1907)-1912
Cleone L Co	Fort Bragg	1			Holmes-Eureka L Co	Carlotta	8	2g 2r	(1905)-1949
Clio L Co	Clio	1g		1907-(1914)	Howard Creek L Co	Westport	2	1r	(1906)
Clover Valley L Co	Loyalton	55	3g 1r	1917-1957	Indian Valley RR (30)	Greenville	22	2r	1917-1938
Marsh L Co (2)	Loyalton	7	1g 1r	1908-1920	Jacoby Creek RR (31)	Eureka	7	2r	(1887, 1889)
Horton Bros	Loyalton	15	1r	(1902)-1908	Johnson-Pollock L Co	Macdoel	6	1g	(1915)-1919
Roberts L Co	Loyalton	5	1r	1900-1917	Kaweah & Giant Forest RR	Three Rivers	2	1r	1888-1890
Boca & Loyalton RR	Loyalton	56	7	1902-1917	Kesterson L Co	Dorris	15	1g	(1926)-1930
(Roberts L Co)				1915-1917	Kespine L Co	Dorris	7	1g	(1922)
(Denver & Rio Grande RR)				1908-1915	Klamath-Calif Redw Co	Klamath	1		1935-1938
Coggins Bros	Weed	6		1900-1905	Klamath Lake RR Co (32)	Copco	30	2r	1903-1913
Conklin Mill	Adin	10		1935-1940	(Weyerhaeuser T Co)				
John Cook	Hornbrook		1r	1892-1902	Oregon Southern RR				
C A & Kenneth Copren	Loyalton	2		1950-1952	Knob Peak L Co	Placerville	10		(1951)
Coulterville L Co	Coulterville		1r	1948-1949	Lk Tahoe Ry & Transpn Co	Truckee	18	4	1899-1926
Crane Creek L Co	Willow Ranch	13	1g	1929-1934	(Truckee L Co) (10)				
Crown Willamette Paper Co	Truckee	15	1g	1920-1930	Lake Valley RR	Bijou	14	2r	1886-1898
Davies-Johnson L Co	Calpine	15	1g 1r	1919-1936	G W Chubbuck	Bijou	4	1r	1884-1886
A B Davis L Co	Jenner	2		1904-	Lamoine L & Trading Co	Lamoine	22	2g	1898-1922
Davis Creek L Co	Lookout	3		1931-1938	Lassen L & Box Co	Susanville	18	1g 3r	1918-1938
DeHaven L Co	DeHaven			-1901	Lassen Lg Co	Susanville	2	1g	1918-1921
DeHaven RR Co	DeHaven			(1917)	Laton L & Investment Co	Markham	3		(1906)-1910
Diamond & Caldon Ry	Diamond Spgs	35	7	1904-1953	Markham L Co	Markham	4	2g	(1887)-1908
(Calif Door Co)					Liberty L Co	Duncans Mills	1		1920-1923
Diamond Match Co (7)	Stirling City	50	4g 3r	1902-1953	Loma Prieta L Co	Aptos	5	2g 1r	1911-1926
Butte County RR Co (27)	Chico	32	4	1903-1913	Long-Bell L Co	Weed	60	1g 7r	1926-1956
Yellow Jacket RR	Lyonsville	10		1908-1913	Weed L Co (33)	Weed	50	6r	1903-1926
Kimshew RR	Stirling City	25	3	(1910, 1912)	Calif & Northeastern RR (34)	Weed RR Co	31	2r	1904-(1908)
E J Dodge L Co	Newburg	8	3r	1914-1930	Loyalton L Co	Loyalton			1900-
Eel River Valley L Co	Fortuna	7	3r	1891-1914	Madera Sugars Pine L Co	Madera	32	4g 1r	1899-1935
Dougherty L Co	Boulder Crk		1r	-1888	Madera Flume & Tradg Co	Madera		1g	1892-1899
Duncan Mills (Land & L Co)	Duncan Mills	5	1r	(1880)-1917	Madrona Land & L Co	Somona Cnty	1		(1877)
J N Durney L Co	Weed	4	1g 1r	1907, 1912	Massack T & L Co	Sprg Garden	3	1g	(1917)-1921
Eel River & Eureka RR Co	Eureka	30	3r	1884-1903	Mattole L Co	Petrolia	4	1r	1908-1923
Calif & Northern RR	Eureka	9		1901-1903	McCloud RIVER L CO	McCloud	60	4	1902-present
Elk Redw Co	Elk	12	2g	1934-1938	McCloud RIVER RR CO	McCloud	100	15r	1897-present
Feather River L Co	Portola	30	3g	(1915)-1943	(McCloud River L Co)				1905-present
Feather River Pine Mills	Feather Fls	40	4g 1r	1927-1950	(Scott & VanArsdale Co)	Fieldbrook	1		1897-1905
Hutchinson L Co	Oroville	40	4g 1r	1922-1927	McCormack & Hauptman	Eureka	10	2r	1902-
					McKay & Co	Occidental M Co			(1891)-1934

Name	Location	Mile-age	Locomo-tives	Dates	Name	Location	Mile-age	Locomo-tives	Dates
A W Barker	Allyn	9	1g	1908-(1911)	Chappell L Co	Granite Falls	1		(1910)
Barnard & Barnard	Skamokawa		1g	1909-	Chehalis L Co	Littell	8	2	1902-(1913)
Bay Lg Co	Raymond		1g		Chehalis M Co	Salkum	10	1g	1916-1940
Beaver Creek L Co	Rochester	3	1r	1918-1925	Chehalis River Lg Co	Independence	2	1g	1923-1926
Beck Bros Lg Co	Quilcene	4	2g	1912-1919	Chehalis River L & Shingle Co	Centralia	5	2g	1902-1914
S J Beck Lg Co	Lexington	3	2g	(1907, 1910)	CHEHALIS WESTERN RR	Chehalis	57	2	1936-present
R C Bell	Skamokawa	3	1r	1917-1918	(Weyerhaeuser Co)				
Bell Lg Co	Deep River		1g	1906-(1915)	Cherry Valley Lg Co	Monroe	45	4g 2r	1902-1930
Bellingham Bay & British Columbia RR (20) (Bloedel-Donovan L Ms) (Bellingham Bay Impvmt Co) (Bellingham Bay Coal Co)	Bellingham	58	8	1888-1912	Chicago L & Coal Co	Maple Falls	4		1913-1916
Bellingham Bay & Eastern RR (12)	Bellingham	19	2	1892-1902	Chinn (Bros) T Co	Maple Falls	8	2g	1902-1926
Bellingham Eastern Lg & Ry Co	Wickersham	9		1910-1912	Chinook L & Mfg Co	Republic	40	3g	(1931)
Bellingham T & L Co	Bellingham	4	1r	(1907, 1910)	Chittenden Land Co	King Cnty	4		1910-(1913)
F A Bennett	Klickitat		1g	1917-1919	Cispus Lg Co	Port Orchard	12	2g	1926-1934
Bennett Lg Co	Monohan	6	1g	1907-(1913)	Clark County T Co	Yacolt	30	3g 1r	1917-1924
Frank Betchart	Roy	8	1g	1916-1947	(Weyerhaeuser T Co)				
Big Fir Lg Co	Darrington	2		1917-1927	Twin Falls Lg Co	Yacolt	30	2g 3r	1903-1917
Big Four L Co	Whatcom Cnty	2	1r	(1907)-1909	Clark Creek Lg Co	Kelso	4	1g 2r	1902-1913
Biles-Coleman L Co	Omak	45	2g	1922-1948	Clear Lake L Co	Clear Lake	55	6g 1r	1903-1927
J C Biles	Montesano	1	1g	1902-	Brattnaber-Waite L Co	Clear Lake	2g		(1900)-1903
Bingman Co	Morton	5		1944-1946	Kennedy & O'Brien	Clear Lake			-1902
Bismark M Co	Tacoma	3	1	1910-(1913)	Skagit Lg Co	Clear Lake	3	1g	1911-1915
Black Lake & Sherman Valley RR	Olympia	3	1	1880-(1890)	Climax Lg Co	Aberdeen	2	1g	(1917)-1919
Black Lake L Co	Olympia	1	1g	(1908)	(Aberdeen L & Sh Co)				
Black River Junction & Franklin RR	Renton	24		(1892)	Climax Shingle Co	Blaine	4	1g	1908-1914
Blackman Bros L Co	Marysville	4	1g	(1881, 1891)	Climax T Co	Maple Falls	5	1g	1918-1919
Blanchard & Alger	Blanchard	5		1890-	Cline & Taylor (3)	Chehalis	1		(1899, 1900)
Blanchard RR	Blanchard	6	6	(1887)-1890	Clipper Shingle Co	Clipper	6	1g 2r	(1917)-1918
Bloedel-Donovan L Mills Lake Whatcom Lg Co	Bellingham	140	2g 3r	1913-1946	Coal Creek L Co	Chehalis	10	2g	1905-1929
Larson Co	Bellingham	30	2g 1r	1900-1913	Harm & Brown L Co	Tenino	1	1g	1908-1912
C A Bloomfield	South Prairie	3	2g	1908-1912	Coal Creek RR Co	Chehalis	1		1903-(1905)
Boeck & White	Hoquiam	2	1r	1918-1919	Cobb & Hawley	Everett	6		1907-
Bolcom-Vanderhoof Lg Co	Standard	10	2g	1908-1918	Cogshall & Metsker L Co	Sedro-Woolley	1		(1907, 1912)
Bolcom-Riley Lg Co	Port Townsend	3	1g	-1908	Coole Shingle Co	South Bend	1g		(1907)
Boulder Ry & T Co	Hazel	8	3g	(1910)	Colling & Byerly	Kelso	1		(1906)
Bradford-Kennedy L Co	Newman Lake			1912-	COLUMBIA & COWLITZ RY CO	Longview	15	2	1929-present
Bridges & Floyd (4)	Puyallup	10	1g	1918-1941	(Weyerhaeuser Co)				
A H Brix L Co	McNeil Isld	3	1	(1917)-1921	Columbia & Washington Ry Co	Vancouver	1r		(1897, 1901)
Clear Lake Lg Co (A P Perry L Co)	Rainier	8	1g 1r	1922-1923	Columbia Lg Co	Grays River	5	1g	(1912)-1918
Brix Lg Co	Rainier	6	1g	1915-1922	COLUMBIA RIVER & GRAYS HARBOR RR CO	Oak Point	4	1r	1883-1891
Knappton Ms & L Co (1) (Brix Bros Lg Co)	Knappton	20	5	1935-1938	Columbia River Lg & T Co	Alger Creek	4		(1913, 1917)
Brix Bros Lg Co	Knappton			(1922)-1935	Columbia River L Co	Vancouver	12	2g 2r	(1902)-1904
Astoria T & L Co	Knappton	10	3g	1913-1926	Columbia River T Co	Vancouver	1	1g	1928-1934
Grays Bay Lg Co (Brix Lg Co)	Knappton	6	4g	1909-1913	Columbia Tie & Co	Yacolt	1	1g	1906-1921
S Broe	Knappton	6	2g	1899-1909	Columbia Lg Co	Skykomish	4	1g	1917-1919
Broughton & Wiggins	Everett	1	1	1919	Skykomish L Co				
Broughton L Co		1		(1913)	Connacher Lg Co	Skykomish	7	1g	(1906)-1917
Buffelen L & Mfg Co	Willard	8	3	1928-1941	Cougar L & Shingle Co	Stevenson	8		1927-
Page L Co	Deming	14	4g	1922-1939	Sam Coulter	Bellingham	5	1r	1908-1912
Burke & Lane L Co	Eagle Gorge	12	1g 1r	1922-1930	Courtney L Co	Snohomish	3		1893-
Butler L Co	Eagle Gorge	9	1g 1r	1901-1922	Cowlitz, Chehalis & Cascade Ry (48)	Mason Cnty	2		(1892)
Byles Lg Co	Colville	22		1906-	Chehalis & Cowlitz RR	Robe	3	1	(1940, 1941)
C B & M Lg Co	Belfast	2	1g	1906-1918	(Washington Electric Ry Co)	Kent	12	2	(1906, 1913)
Cabin Creek L Co	Bellingham			1926-1928	Twin City RR Co	Sauk	2	1g	1920-1923
D J Cain & Co	Brinnon	6	1g	1925-1932	Craig Lg Co	Chehalis	39	3r	1916-1955
Cain L Co	Easton	12	2g	1918-1940	Creech Bros L Co				
Calpenham L Co	Thornwood	3	1g	(1907)-1909	Crocker Lake L Co	Port Angeles	30	3	1927-1946
Camano Commercial Co	Deming	5	1g	1910-1915	Crown Zellerbach Corp	Port Angeles	22	4g	1927-1946
Campbell L Co	Kapowsin	4		1911-(1913)	Crown Willamette Paper	Carlsborg	6	2g	1924-1927
Chinook L Co	Camano	4	1g	1908-(1910)	Cathlamet T Co	Brinnon	30	2g 1r	1916-1942
Campbell (Bros) L Co	Deep River	8	2g	1908-1916	(Portland L Co)	Brinnon	6	2g	1904-1916
Campbell M Co	Deep River	4	1g	1906-1908	Bradley Lg Co	Cathlamet	8	3g	1908-1923
Canal Lg Co (1)	Redmond	16	3	(1906)-1926	Armstrong-Pelton Lg Co	Cathlamet	2	1g	1901-1908
Canyon L Co	Charleston Bay	1	1g 1r	1926-1931	Fibreboard Products (49)	Washington Pulp & Paper	18	2g	1910-1929
Cape Horn RR Co (Ore & Wash Lg Co)	Hoodspoint	6	2g	1901-1930	Cumberland Mills Co	Centralia	4		1900-
Carlisle L Co	Robe	3	1g	1905-1912	Dabob Bay Lg Co	Ilwaco			
Cascade T Co	Prindle	20	2g	1908-1914	Dalkena L Co	Raymond	4	1g	1908-1913
Cascade Shingle & T Co (1)	Onalaska	30	3g 4r	1924-1943	Damon & Minard Co	Quilcene	4	2g	1918-1920
D Cavalero	Onalaska	10	2g	1914-1924	Danaher L Co	Cathlamet	60	3g 3r	1928-1958
Gig Harbor T Co	Onalaska	6	3g	1916-1917	Davidson Lg Co	Cathlamet	16	5g 1r	1927-1928
Cavano Lg Co	Onalaska	11	1g 1r	1915-1943	Day Creek L Co	Cathlamet	14	3g	(1902)-1923
Carlson (Bros) Lg Co	Carlisle	9	1g 2r	1914-1920	Deep L Co				
Carlson L Co	Aberdeen	1		1902-(1915)	Deep River Lg Co	Port Angeles	30	3	1927-1946
Cascade L Co	Mineral	4	1g	1923-1930	Deer Park L Co	Port Angeles	22	4g	1927-1946
North Yakima & Valley RR (12)	Yakima	42	4g 2r	1908-1954	Deer Park M & T Co	Carlsborg	6	2g	1924-1927
Cascade T Co	Yakima	40	3	1905-(1914)	Izett L Co	Brinnon	6	2g	1904-1916
Case Shingle & T Co (1)	Reliance	30	3g 4r	(1903)-1942	Washington Pulp & Paper	Neah Bay	25	3g	1934-1942
D Cavalero	Raymond	2	2	1905-1938	Cumberland Mills Co	1		(1912)	
Gig Harbor T Co	Gig Harbor	4		(1913)	Dabob Bay Lg Co	Dabob	2	1	1910-(1913)
Cavano Lg Co	Gig Harbor	4	2	1908-(1910)	Dalkena L Co	Dalkena	12	1g	1923-1936
Cedar Creek L Co	Toledo	15	3g	1926-1929	Elma	6		(1912, 1914)	
Cedar Lake L Co	Cedar Falls	6	2g	1913-1919	Darrington	18	2g	1910-1923	
Cedarhome L Co	Stanwood	3	1g	1907-1921	Deer Park	5			
Cedar River M Co	Maple Valley	3	1r	1908-(1914)	Deer Park Central Ry	Deer Park	25		1920-1936
Central L Co	Whatcom Cnty	3		(1909)-1916	Springdale & Long Lake RR	Darrington	1		(1942)
Central L Co	Napavine	3		(1906)	(Wash Water Power Co)	Discovery Dale	20		1911-1920
Central L Co	Tacoma	2		1911-(1913)	Defiance L Co	Buckley	8	1g	(1907)-(1910)
Centralia Eastern RR & L Co (12)	Centralia	10		1907-(1916)	Dempsey L Co	Allyn			
Chambers Lg Co	South Bend	3	1g	1916-1919	Hamilton	30	2g 1r	1907-1929	
Kleeb L Co	South Bend	2	1g	1910-1916	Kapowsin	15	3g	1918-1945	
Chandler Bros	Frances	1	1r	1904-1908	Darrington	2		(1918)	
Chapman Lg Co	Stella			Great Northern M Co	Denhart L Co	Machias	4	2g	(1906)-1912
Weist Bros	Stella	1		1901-(1906)	Dickey & Angel Lg Co	Startup	2		1929-1931
				Dickey & Wood Lg Co	Henry Dickinson L Co	Stanwood	2	1	1910-1912
				Great Northern M Co	Stanwood	2	1		1908-1910
				Dickson-Tobey Lg Co	Stanwood	2	1		1909-(1913)
				Discovery Bay Lg Co	Uncas	11	3g		(1917)-1926

Name	Location	Mile- age	Locomo- tives	Dates	Name	Location	Mile- age	Locomo- tives	Dates
Dittman L Co	Napavine	3	1r	1909-1916	Gold Bar L Co	Gold Bar	10	2g 1r	(1905)-1917
Dittman & Springstein	Napavine	1	1r	(1907)-1909	Goodro Lg Co	Shelton	5	1g	1920-1926
Donovan-Corkery Lg Co	Aberdeen	50	4g 1r	1923-1934	Gorman & Lawson	Ridgefield	7	2r	(1907, 1910)
Coates-Fordney Lg Co	Aberdeen	15	3g	1910-1923	Goshen L Co	Bellingham	2	1g	(1917)-1923
Coates (Bros) Lg Co	Aberdeen	7	3g	1905-1910	Grace M Co	Bothell		1g	(1909)
Donovan-Dubois L Co	Stevenson	4	1g	1919-1926	Graham Bros	Bucoda			1915-
Fir L Mfg Co	Stevenson	3		1918-1919	Great Northern L Co	Leavenworth	30	3g	1916-1926
Dosewallips T Co	Brinnon	1		1908-(1910)	Lamb-Davis L Co	Leavenworth	18	1g	1909-1916
Doty L & Shingle Co	Doty	12	3g 1r	1904-1929	Wenatchee Valley &	Leavenworth	30	1g 1r	1907-1916
Doty L Co	Doty	11	1g	1902-1904	Northern Ry				
Doty & Stoddard L Co	Doty			1900-1902	Green Cedar Shingle Co	Elma			1907-
Elk Creek & Grays Harbor Ry	Doty	11		1913-1916	Green River L Co	Baldi	6	2g	1918-1928
Doud Bros L Co	Buckley	2	1r	1903-1908	Greenwood Lg Co	McIntosh	8	2g 1r	1923-1928
Dry Creek Lg Co	Monroe	7	2g	1926-1929	Griffin Transportation Co	Aberdeen	22	3g	1922-1938
Dubois L Co	Woodland	4	1g	1911-1926	Groening Stiles T Co	Tacoma	1		1908-(1913)
Duncan L Co	Napavine	6		1918-1919	Gruber & Docherty L Co	Port Orchard	5	1g	1908-(1910)
Dungeness T Co	Carlsborg	12	2	1936-1938	I B Grungstad	Yelm	5	1g	1919-1938
Eagle Falls Lg Co	Index	5	1g	1925-1926	J P Guerrier L Co	Skamokawa	3	1g	1918-1919
Eagle Gorge Lg Co	Eagle Gorge	8	2g	1947-1955	H B & A Lg Co	Napavine	2	1g	(1917)-1923
Buckley Lg Co	Eagle Gorge	22	2g 1r	1919-1947	H J & M Lg Co	Grays River	9	2g	1910-1923
Eagle M Co	Centralia	1	1g	1908-1912	H L & S Co	Granite Falls	2		1931-1933
Eastern & Western L Co (2)	Eufaula	13	3g 2r	1902-1927	J M Hackett Lg Co	Hoquiam	6	2	(1918)
Western L Co	Eufaula			1895-1902	Hall & Bishop	Carlisle	2		(1916)-1918
B F Brock Lg Co	Eufaula	1	1g 1r	1883-1902	Hall & Rowland	Port Crescent	3	1g	(1904)-1910
Mosquito & Coal Crk RR (B F Brock)	Eufaula	3	1r	1883-1904	Henry Hall	Amboy	30		1953-1957
Eufaula Co	Eufaula	24	3g 2r	1915-1927	J W Hall	Onalaska	8	2r	1921-1924
Eastern Ry & L Co	Centralia	16	4g 1r	1903-1940	Stanwood	1	1		(1907, 1913)
Tacoma, Olympia & Chehalis Valley RR	Centralia	10	2	1910-1914	Snohomish	2			(1913)
Eatonville L Co	Eatonville	20	3g	1908-1940	Skagit Cnty	1			1890-(1892)
Ebey Lg Co	Arlington	30	5g 1r	1908-1927	Halleys & Alger	Oso	1g		1905-(1909)
Eclipse M Co	Everett	11		1911-(1915)	Haltermann Lg Co	Hamilton	3g		1907-1923
Eclipse Shingle Co	Blaine	3	1g	(1907, 1910)	Hamilton Lg Co	Lyman Pass RR			1916-
Edgcomb M Co	Arlington	2	1	(1910)	Hamma Hamma Lg Co	Bremerton	15	4r	1922-1933
Edlund Lg Co	Goldbar	23	3r	1938-1940	L Hammerschmidt & Sons	Yelm	5	1g	1926-1932
Edmonds & Eastern RR	Edmonds	5		(1910)	Hammond L Co	Kelso	15	3g	1908-1929
J W Edwards	Lynden	5	1r	(1910, 1911)	Harbor Lg Co	Whidbey Isl	2	1r	1906-1908
Eiswerth Bishop Lg Co	Fairfax	6	1g	1917-1923	Harbor Plywood Corp	National	15	2r	1945-1957
Elbe L & Shingle Co	Elbe	10	1g	1908-1936	Harding L Co	Tacoma	7	1g	1909-1922
Electric Lg Co	Tacoma	8	1g	(1907, 1913)	Wheeler-Reese L Co	Tacoma	7	1g	1909-1920
Ellis Bros	Raymond	2		1906-1908	Hart Harstad L Co	Yelm	6	1g 1r	1922-1935
Elma L Co	Elma	3	1g	1907-(1915)	Hart-Wood L Co	Raymond	8		1919-
Emery & Nelson L Co	Napavine	12	2g	1909-1927	(Spruce Prod Div #V)				
Empire T Co	Anacortes	2		1913-	Hartford Eastern Ry	Hartford	42	1	1915-1933
J H England L Co	Winlock	1	1	1926-1929	(Puget Sound Pulp & T Co)				1929-1933
English L Co	Mt Vernon	70	7g 1r	1901-1946	(Rucker Bros Co)				1925-1929
Parker-Bell L Co	Bryant	15	2g	(1905)-1922	(NP lease to Ruckers)				1915-1925
Parker Bros & Co	Bryant		1g	(1901)	Monte Cristo Ry Co	42			1900-1915
Erickson & Furnham	Rockport				(NPRR)				
Erickson Lg Co	Elwha	10		1914-1934	Everett & Monte Cristo	57			1892-1900
Peterson Lg Co	Dungeness			-1914	RR				
Geo W Evans & Co	Seattle		2g	1906-	(Rockefeller interests)				
Everett Lg Co	Bothell	5	1g	1907-1915	Snohomish, Skykomish & Spokane Ry	6	1		1891-1892
Faber Lg Co	Tulalip	10	3g 1r	1915-1929	Hartford Shingle Co	Sisco	4		1916-
Fairfax L Co	Faber	1		1920-1921	Haskins & Haskins	Mineral	2	1g	1931-1933
Fairhaven & Southern RR (Lake Whatcom Lg Co) (Seattle & Montana RR) (Great Northern interests)	Fairfax	16	3g	1934-1936	Haverstick L Co	Sumas	1		(1907, 1910)
Fairservice-Gierin T Co	Bellingham	64		1888-1917	W R Hawthorne Lg Co	Bremerton	5	1g	1915-1926
Faler & Davidson, Inc	Port Angeles	5	1g	1926-1933	Healy & Sisco	Marysville	1g		1896-(1901)
Far West L Co	Quilcene	2	1g	1924-1926	Frank Henry	Bellingham	2	1r	(1910)
Feezle Lg Co	Tacoma	3	1r	1905-1909	Hewitt-Lea L Co	Bellevue	10	1g	1906-1920
D Ferguson	Skamokawa	7	1g 1r	1918-1930	Hewitt Lg Co	Hoquiam	4	1r	(1907)-1915
Fern Creek L Co	Warnick			(1907)-1908	High Point M Co	Fall City	6	1g	1918-1928
Fendale L Co	Frances	2	1g	(1903)-(1913)	Hill Lg Co	Adna	5	2g 1r	1912-1919
Fidelity L Co	Oakville			(1908)-1913	Hillman's Snohomish Cnty Land & Ry Co	Snohomish	6		1908-(1913)
D J Finn Lg Co	Newport	2	1g	(1909)-1915	Hilo L Co	Robe	2		1926-1929
Fir Tree L Co	Stevenson	1	1r	(1917)-1919	Hobi T Co	Aberdeen	25	3r	1923-1932
J M Fish	Olympia	5	2r	1914-1924	Henry Hoeck	Frankfort	1	1g	(1907)
Fisher's Lg RR	Bothell	3	1g	(1908)	Hoff & Pinkey, Inc	Lawrence	5	1g	1923-1934
Flaherty & Daly	King Cnty	2		1926-1928	Hogg-Houghton Lg Co	Glacier	3	1g	1923-1931
Flanigan L Co	Port Angeles	2		1919-	Holly L Co	Hood Canal	4	1g	(1907)
Fobes-Wilson Lg Co	Ethel	2	1g	1921-1926	Hood Canal Lg Co	Hoodspoint	4	1g	1923-1927
Fobes Lg Co	Maple Falls	2	1g	1923-1926	Hoquiam L & Shingle Co	Hoquiam	4		(1910)
Christie T Co	Wickersham	7	1g	(1917)-1923	Houghton Lg Co	McMurray	12	2g	1905-1924
Fobes T Co	Colville	3	2g	(1927)	Atlas L (& Shingle) Co	McMurray	7	2	1901-1923
Forbes T Co	Nagrom	3	2g	1918-1929	Howe-McGibbon T Co	Nagrom	4	2g	1926-1933
Ford's Mill	Matlock	1	1g	1918-1919	Hulbert L Co	Lk Stevens	5	1g	(1907)-1923
Forest L Co	Acme	1		1921-1924	Hulbert Lg Co	Everett	2	1g	(1909, 1913)
Fortson Lg Co	Darrington	2	1g	1913-1921	Huron L Co	Bothell	4	1r	(1889, 1890)
Sol Foss	Montesano	2	1	(1910)	Montesano				(1909)
Foster-Newbegin L Co	Graham	10	2g	1918-1926	Index-Galena L Co	Robe	2	1	1929-1931
Foster L Co	Tacoma			(1909)	Puget Sound, Skykomish & Eastern RR	Index	14	2g	1910-1928
T A Foster L Co	Morton	8		(1951)	Ingersoll Shingle Mfg Co	Shelton	1		1918-1919
L B Frazier & Son	Okanogan	8		1937-1938	Inland Lg Co	Morton	3	1g 2r	1921-
Frederickson Lg & Co	Skamokawa	5	1g	1926-1929	Linco Log & L Co	Morton	1g		1920-1921
Frederickson L Co	Shelton			(1927)	Inman-Poulsen Lg Co	Stella	12	2g 2r	(1907)-1923
Jacobson L Co	Frederickson	2	1r	1909-(1910)	Joe Irving	Arlington	4		1898-1903
Fredson Bros Lg Co	Frederickson	1		(1907)-1909	J K L Co	Hamilton Crk	9	2g	1913-1918
Cushman Lg Co	Shelton	25	2g	1905-1928	Hamilton Crk RR Co	Hamilton Crk	8	1g	1913
French & Woodin Lg Co	Bothell	8	1g	1909-1912	Jackson Lg Co	Arlington	3		(1947)
Emil Fullner	Deming	2		1931-1933	Jackson Lg RR	Jackson Lg Co	2		(1887, 1890)
William Gage	Skagit Cnty	2	1	1884-	Jamison L & Shingle Co	Darrington	14		1923-
Galbraith (Bros) Lg Co (1)	Clipper	4	1g	1923-1947	Jefferson Cnty Lg Co	Port Ludlow	5	2g	1913-1916
Gammey & Scott	Arlington			(1904)	G B Jenison	Blaine			(1910)
Gardiner T & Land Co	Discovery Bay	3	1g	1907-1919	Sam Jenkins	Toledo			(1901)
Gate City L Co	Thurston Cnty			(1912)	Jennings & Nestos Lg Co	Rockport	3	2r	1923-1936
Gatewood & Lasley Lg Co	Snohomish			1910-1912	Joe Creek Lg Co	Pacific Bch	4	1g	1916-1919
Gay Lg Co	Arlington	1		1924-1926	Wiest & Thompson	Pacific Bch	1		1915-1916
Gillis M & Mfg Co	Nooksack			1909-	Morton	1	1g		1921
Dan Gillis	Montesano			(1901)	Johnson-Dean L Co	Robe	12	3g	1908-1918
Globe L Co	Frances	4	2r	1905-1927	Johnson Creek L Co	Bucoda	7	1g	1909-1915
					J J Johnson	Frances	2	1r	(1907)

Name	Location	Mile- age	Locomo- tives	Dates	Name	Location	Mile- age	Locomo- tives	Dates	
Kalb & Larkin	Raymond			1910-1912	Marysville & Arlington RR	Arlington	16	4g	1909-1928	
Armstrong-Leonard Lg Co	Raymond			1905-1910	Allen C Mason	Shelton	5		(1892)	
Kangley T Co	Maple Valley	2	1g	1911-(1913)	Mason Cnty Lg Co	Olympia	85	4g 6r	1891-1941	
Keefe L Co	Eatonville	1	1r	(1923)	Black Hills & North- western RR	Olympia	20	3g 1r	(1907, 1913)	
Kellogg Shingle Co	Big Lake			(1910)	Vance L Co	Elma	10	2g	(1906)-1923	
Kelso Eastern	Kelso	4		(1928)-1930	May Creek Lg Co	Renton	6	1g	1909-1911	
Kent L Co	Maple Valley	15	2g 1r	1902-1923 (1925)	Fish & Peterson	Renton	5	1g	1908-1909	
Kirby Bros	Tenino	1			French, Fish & Peterson	Renton	3	1r	(1907)-1908	
Kirby M Co	Yelm	2	1r	1912-	Maytown L Co	Tenino	5	1g 1r	1912-1924	
(Merrick-Robb L Co)					D H McCall	Yacolt	7		1927-	
North Star L Co	Yelm	3	1r	1908-1912	A McCann	North Bend	2	1	(1910)	
Lindburg & Shuh Lg Co	Yelm	1	1r	(1907)-1908	McCaughay M Co (1)	Fortson	3	1g	1909-1929	
Kittitas L Co	Ellensburg	2	1g	1923-1927	McCleary T Co	McCleary	12	3r	(1903)-1931	
Klement & Kennedy	Darrington	6	3g	1921-1936	Mosher & McDonald Lg Co	Olympia	12	1g 1r	1894-1905	
KLICKITAT LOG & L CO	Klickitat	20	2g	1922-present	Puget Sound & Chehalis Ry Co	Olympia	12	1r	1888-1894	
(St Regis Paper Co)				1957-present	Shamrock & Western Ry	McCleary	2		-1931	
(J Neils L Co)				1922-1957	Jameson Lg Co	Olympia	1r		-1905	
Klickitat Northern RR (Western Pine L Co)		16	3g	1915-1922 1918-1922	McCormick L Co	Pe Ell	12	2g 1r	1908-1930	
A H Kneeland	Shelton	3	1g	1906-(1910)	H McCormick L Co	Pe Ell	4	1r	(1896)-1908	
C F Kneeland Lg Co	Union	4	1g	1924-	McCormick & Columbia River RR	Pe Ell	22	1r	1906-(1912)	
Wm Knight & Co	Skagit Cnty	3	1g	(1892)						
A W Knight & Co	Maple Falls	4	1g	(1917)-1921	McCoy-Loggie T Co	Deming	12	1g 1r	(1902)-1923	
KOSMOS T CO	Kosmos	90	8	1939-present	Pat McCoy	Edison	7	1g	1902-1911	
(U S Plywood Corp)					Geo McCoy	Napavine	2		(1907)	
Kuhn Lg Co	Hoquiam		1g	(1907)	Wm McCosh Lg Co	Bellingham	4	1r	(1907, 1913)	
Lacamas Lg Co	Chehalis	8	2g	1922-1926	McCuish Lg Co	Prairie	8	2g	1923-1924	
La Grande L Co	La Grande	1	1	1926-1929	D McDougall	Buckley	1		(1913)	
Lake Cle Elum L Co	Cle Elum	1	1g	1922-1933	McDougall & Jackson	Buckley	1g		1901-1909	
Lake Creek L Co	Morton	1		1921-1924	J W McDaffion Lg Co	Tacoma	2	1g	(1907)-1911	
Lake Goodwin Shingle M Co	Marysville	6	1	(1910)-1912	McIntosh & Swan	Olympia	3	1g	1908-(1910)	
Lake Riley L Co	Hazel	4	1g	1914-1922	McIntosh & Weller	Olympia	2		(1907)-1908	
Lake Sawyer L Co (1)	Issaquah	4	1g 1r	1922-1934	McKay & Swan	Tenino	2	2g 1r	1926-1929	
Neukirchen Bros Inc	Issaquah	3		1918-1922	McKenna L Co	McKenna	18	1g 2r	1914-1932	
Lakeshore RR	Snohomish			(1893)	Salsich L Co	McKenna	9	2	1908-1914	
Lamson Lg Co	Darrington	4	1g	1923-1933	McMillan L Co	Orting	5	1g	1916-1929	
Landreth Bros L Co	Wenatchee	2	1g	1922-1932	McNeil-O'Hearne Co	Concrete	4	1g	1921-1926	
Thomas Larkin	Menlo	3	1g	(1917)	McReavy & Co	Shelton	2r		(1883)	
Lawson Lg Co	Stevenson	5	1g	1921-1927	Mealy L Co	Chehalis	1		1900-	
Lay L Co	Big Lake		1g	(1916)	Meiklejohn & Brown Co	Monroe	1		(1917)-1920	
Lazarus (Bros) Lg Co	Carnation	4	2g	1921-1931	Mendota T Co	Centralia	1	1r	1919-1921	
Leavitt & Leathers, Inc	Marblemount	9		1938-1940	L B Menefee L Co	Winlock	9	2g	1919-1923	
C M Leavitt	Issaquah	3		(1931)	Black Diamond L Co	Winlock	16	3g	1917-1919	
Lebam M & T Co	Lebam	5	2g	1906-1927	J A Veness L Co	Winlock	16	2g	(1904)-1917	
Leitch L Co	Ashford	1		(1917)	Mentzer Bros L Co	Tacoma	2		(1891)-1902	
Leudinghaus L Co	Dryad	10	3g	1919-1929	Meredith L Co	Kent	3		(1913)	
Leudinghaus Bros (2)	Dryad	5	1g 1r	1903-1919	Merrill & Ring L Co	Pysht	30	5g	1916-1944	
Meskell L Co	Dryad	4	1g	1914-1921	Mukilteo Lg Co	Mukilteo	14	2g	1908-1916	
J R Cain L Co	Dryad	3	1g	1909-1912	Mid-Columbia L Co	Carson	30	1g 2r	1926-1933	
Meskill & Columbia River Ry	Dryad				Midland L Co	Tacoma	6	1g	1918-1920	
Libby-Hay Lg Co	Shelton	2	1g	1908-(1910)	Midway Lg Co	Stella				
Liberty L Co	Eatonville	12		1918-	Miller & Dunn	Cle Elum	1	1g	1922-1924	
Tidewater L Co	Eatonville	11	1g 2r	(1905)-1918	Geo Miller	Markham	6	1	1932-1933	
Liberty L Co	Wickersham		1g	1913-	Ward-Sargent Lg Co	Markham	6	1g	1923-1932	
Linberg L Co	Pierce Cnty	2		(1909)	J B Miller Lg Co	Cathlamet	10	1r	(1907, 1916)	
Lincoln Creek L Co	Centralia	10	3g	1906-1932	Miller L Co	Sultan	25	4g	1923-1940	
Lindberg & Hobl Co	Mineral	1g		1944-1947	M C Miller L Co	Cle Elum	2	1	1935-1943	
Linde Shingle Co	Carlisle	2	1g	1923-1933	Millett & McKay	Burlington	2		1883-(1889)	
Lindstrom-Handforth L Co	Rainier	10	1g 1r	1910-1929	Mitsap-Dickey Co	Swan-Hamann L Co	White Salmon	2		1918-1919
Bob White L Co	Rainier	4	1r	1906-1910	Mineral Creek L Co	White Salmon	2		(1912)-1916	
Little Falls L Co	Long Lake		1g	(1908)	Mineral Lake Lg Co	Mineral	2	1g	1926-1932	
Little Mashell L Co	Elbe	3		1908-(1909)	(Weyerhaeuser T Co)	Ashford	10	1g 1r	1911-1926	
Little Rock L Co	Olympia	2	1g	(1910)	Minnesota RR (Minnesota L Co)	Mt Vernon	3	1r	(1907)-1911	
Lochloy T Co (1)	Everett	5	1g	1905-1923	Moe Bros	Poulsbo	6	1g	1907-1911	
Star Lg Co	Hartford	5	1g	(1907)-1923	Mogul Lg Co	Bellingham	5	1g	1904-1911	
Loeb-Cutler L Co	Granite Falls		1g	(1906)	Monarch T Co	Tacoma	6		1908-(1913)	
Long-Bell L Co	Longview	56	3g 10r	1924-1953	Monroe Investment Co.	Monroe	2		(1909, 1913)	
Long Lake L Co (1)	Spokane				Montgomery L Co	Lake Stevens	25	2g 2r	1922-1947	
Phoenix L Co	Springdale	14	2g	1906-1924	Montorne L Co	Big Lake	12	3g	1926-1931	
Hedlun L & Mfg Co	Marcus	32	3g	1927-1933	Mooers Lg Co	Clark Creek	1		(1899)	
Edwards & Bradford L Co	Elk	25	4g	1916-1932	Moore Lg Co	Skamokawa	4	1g	1923-1933	
Consolidated L Co	Elk	18	3g	1902-1916	Morgan Bros L Co	Wickersham	6	1g	(1909, 1913)	
LONGVIEW, PORTLAND & NORTHERN RY (International Paper Co)	Longview	32	5	1924-present	Morrison M Co	Nagrom	6	2g 1r	1904-1924	
(Long-Bell L Co)				1956-present	Mountain T Co	Bellingham			(1907, 1915)	
Lowell Lg RR	Everett	5		1924-1956	Willard-Case L Co	Kalama	13	3g	1910-1926	
Lucas-Stronach L Co	Tacoma	2	1	(1887-1890)	Mud Bay Lg Co (51)	Kalama	5		-1910	
Lucas L Co	Eagle Gorge	3	1	(1910)	Thurston Cnty (Central) Ry	Olympia	35	3g 3r	1906-1941	
Lyle-McNeil & Co (3)	Deming				Muck Creek T Co	Roy	13	1g 2r	1908-1918	
Lynch Creek Lg Co	Kapowsin	1		(1907, 1910)	Mukilteo L Co	Mukilteo	1		(1909)	
Lyon & Haynes	Mineral	2	1g	1931-1932	Mullenix Bros, Inc	Pe Ell	1	1	1938-1951	
Lytle-Inch Lg Co	Morton	6	1g	(1923)-1924	Murphy T Co	Grays River	9	3g	(1917)-1921	
Lytle Lg & Mercantile Co	Elma	8	2g	(1906)-1929	Murphy-Scott L Co	Carrolls	4	2g	(1917)-1919	
Porter RR	Elma	4	2	(1907, 1910)	James E Murray	Yacolt	5	2g 1r	(1915)-1926	
Hoquiam River Ry	Hoquiam	3		1910-(1917)	Mutual L Co (2)	Tacoma	2	1g 1r	(1907)-1911	
M & M T & Realty Co	Mineral				Mentzer Bros L Co	Oakville	1		1900-1908	
M B Lg Co	Markham	15	3	1923-1951	Myers L Co	Tenino	25	4g	1913-1943	
Markham Shingle Co	Markham			1931, 1932	N & M L Co (1)	Tenino	4	1r	(1902)-1913	
Mack Lg & T Co	Redondo	5	1g	(1913, 1917)	Napavine L & Mfg Co	South Prairie	3	2g	1908-(1910)	
Main Lg Co	Shelton	7	1g 1r	1923-1934	Somerville (Bros) L Co	Rochester	5	3g	1906-1924	
Malone Creek Lg Co	Grays River	4	1g	1929-1931	Naselle River RR (Spruce Prod Div #VII)	Napavine	7	2g	1909-1919	
Malone Mercantile Co	Elma					Naselle	6	1r	1898-1916	
A C Manning Lg Co	Lk Whatcom	6	1g	(1915, 1917)			2		1918	
(Bloodel-Donovan L Mills)	Fairfax	17	4g	1910-1934	National Glass & Door Co	Chewelah	6	1g	1923-1929	
Manley-Moore L Co					Geo M Neidhart	Custer	2	1r	1928-1929	
Maple Valley L & Mfg Co	South Prairie	1	1r	(1908)-1910	J Neils L Co	Klickitat	32	3g	1922-1952	
Marcilla L Co	Maple Valley	3	1g	1904-(1913)	Western Pine L Co (1)	Glenwood	4	3g	1909-1922	
Markham & Callow	Chehalis	1	1g	1926-1933			3		1927-1931	
Independence				(1928)						
The Marsh Co	Chehalis	5	1g	1929-1932						
H H Martin L Co	Centralia	12	2g 1r	1903-1924						
Maryott & Spencer Lg Co	Brinnon	7	1g	1918-1919						
Dungeness Lg Co	Dungeness	15	2g	1912-1918						
Pacific Lg & T Co	Dungeness	5	1g	1908-1912						

Name	Location	Mileage	Locomo-tives	Dates	Name	Location	Mile-age	Locomo-tives	Dates
Nelson-Neal L Co	Bryant	5	1g	1908-1925	Port Susan Lg Co	Silvana	8	2g 1r	1897-1907
The Chas Nelson Co	Port Angeles	7	2g	1926-1929	Port Townsend & Pacific RR	Port Townsend	18		(1907, 1908)
Puget Sound M & T Co	Port Crescent	27	6g	(1907)-1926	PORT TOWNSEND RR	Port Townsend	12	2	1945-present
Little Riv Ry & Lg Co	Port Crescent	6	2g	1910-1916	Port Townsend Southn RR	Port Townsend	12		1929-1945
Pt Crsnt T Trnsptn	Port Crescent			1910-(1911)	Port Townsend &	Port Townsend	27	1r	1914-1929
Nemah River Lg Co	Raymond	14	2g 1r	1919-1936	Puget Sound Ry Co	Port Townsend	26		1891-1914
North Nemah RR	Raymond	8		1918-1919	Southern RR (53)	Port Townsend			
(Spruce Prod Div #V)	Kelso	17		1937-1947	Olympia & Chehalis Valley RR Co	Olympia	17	2r	1881-1891
Nesbitt Bros	So Prairie	4	1g	1918-1926	Olympia & Tenino RR	Olympia	15	2r	1878-1881
Nettleton-Bruce Lg Co	Chehalis		1r	(1917)	Thurston Cnty RR	S W Porter	Winlock	1	1905-1912
Nettleton Bruce & Eshback	King Cnty			1911-(1913)	Portland, Vancouver &	Vancouver	20	4r	1897-1903
Neut & Packard Lg Co	Napavine	2	1r	1906-1911	Yakima Ry (12)	Vancouver			
Newaukum M Co	Onalaska	1		1918-1919	Vancouver, Klickitat &	Vancouver	13		1888-1897
Newaukum River L Co	Mt Vernon	2		(1887, 1890)	Yakima RR	Winlock			1899-1906
Newkshamp's RR	Rochester	4	3g	1918-1921	Prescott & Veness L Co (4)	Preston	8	1r	1914-1936
Ninemire & Morgan L Co	Klickitat	2	1g	1915-1922	PUGET SOUND & BAKER RIVER RY	Hamilton	26	2r	1906-present
Nordby & Scott	Everett	3	1	(1915)-1926	(Scott Paper Co)				1951-present
Mrs J Norstrom & Son (52)	Everett	2	1	1909-(1915)	(Soundview Pulp Co)				1937-1951
J E Norstrom	Grays River	12	3g	1913-1919	(Lyman T Co)				1930-1937
North Bank L Co	North Bend	32	4g	1923-1944	(English-Dempsey)				1906-1930
North Bend T Co	North Bend	9	2g	1906-1923	Hamilton & Baker River RR				
North Bend L Co	North Bend	9	2	1910-1915	Puget Sound & Cascade Ry Co	Mt Vernon	27	1g 1r	1912-1938
North Bend & Eastn RR	Tacoma	3		1906-1911	(Puget Sound Pulp & T Co)				1929-1938
North End L Co	Shelton	1	1g	1908-1911	(Clear Lake L Co)				1913-1929
North Fork Lg Co	Ariel	9	3g	1907-1928	(Skagit Lg Co)				1912-1913
North River Lg Co	Aberdeen	1		1929-1939	Puget Sound & Willapa Harbor Ry Co (11)	Raymond	60		1913-1918
North Point RR Co	Stella	1		(1908, 1910)	Pacific & Eastern Ry Co	Raymond	7	2g 1r	1907-1913
(Northwest Door Co)					Puget Sound Electric Ry Co	Milton	8	1r	(1907, 1910)
North Western L Co	Hoquiam	32	4g 2r	1917-1941	Puget Sound Mills & T Co	Bellingham	18		1898-1909
Northern Coast T Co	Maple Valley	14	1g 1r	(1907, 1915)	Puget Sound Pulp & T Co	Bellingham	40	5g 1r	1929-1952
Northwest L Co	Cedar Falls	15	3g	1908-1929	Rucker Bros Co (1)	Hartford	11	1g 1r	(1905)-1929
Kerry M Co	Cedar Falls	8	2g 2r	1897-1908	Tulalip Co	Hartford	5	1g	(1917)-1919
Northwood Cedar Co	Bellingham	4		(1900)	Cavanaugh T Co	Hartford	10	3	1909-1918
Oak Point Piling & L Co	Stella	8	2g	1904-(1913)	Hartford Mfg Co	Hartford	1	1g	(1907)-1909
Oakland Bay Lg Co	Shelton	4	1g	1909-1922	S E Wright Lg Co (7)	Hartford	9	3g	(1907)-1909
Ohio Match Co	Metaline Falls	3	1g	1921-1930	Rucker M Co	Hartford	2g		(1905)-1909
Ohms & Ragen	Pomeroy	2		(1910)	Puget Sound Sawmills & Shingle Co	Bellingham	30	3g	1918-1931
Olson Bros	Deep River	1		1901-(1904)	Puyallup Valley L Co	Puyallup	3	1g	(1906)-1909
Olson Bros L Co	Oakville	1		1926-1928	Quinault L Co	Raymond	4	2	1908-(1915)
Olympia & Mt Rainier RR	Olympia	3	1	1886-(1890)	Kalb-Gilbert L Co	Raymond	1	1r	1906-1908
Ellis Lg Road	Olympia		1g	(1885)-1886	Quinault Shingle Co	Humptulips			(1918)
Olympia Lg Co	Olympia		1g	(1890's)	Rainier Lg Co	Everett	12	3	(1907)-1924
Olympia, Sherman Valley & Grays Harbor RR & L Co	Olympia			1890-	Tulalip Co	Hartford	11	1g 1r	(1905)-1929
Oregon & Washington Lg Co	Glacier		1g	(1910)	Cavanaugh T Co	Hartford	5	1g	(1917)-1919
Oregon L Co	Cooks	5	1r	(1904, 1907)	Hartford Mfg Co	Hartford	10	3	1909-1918
Oregon Rafting Co	Toledo	2	1r	(1907, 1910)	S E Wright Lg Co (7)	Hartford	1	1g	(1907)-1909
Oso Lg Co	Oso	6	2g	1906-1911	Rucker M Co	Hartford	9	3g	(1907)-1909
Ostrander Ry & T Co	Kelso	31	5g 2r	(1892)-1940	Puget Sound Sawmills & Shingle Co	Bellingham	30	3g	1918-1931
Overton Lg Co	Allyn	8	1g	1926-1934	Puyallup Valley L Co	Puyallup	3	1g	(1906)-1909
Overton L Co	Orting	3	1g	1916-1919	Quinault L Co	Raymond	4	2	1908-(1915)
Pacific & Eastern Ry (11)	Raymond	8	2g 1r	1907-1913	Kalb-Gilbert L Co	Raymond	1	1r	1906-1908
Pacific Lg Co	Deep River	10	4g	(1907, 1914)	Quinault Shingle Co	Humptulips			(1918)
Pacific National L Co	Ashford	12	3g 2r	1905-1949	Rainier Lg Co	Everett	12	3	(1907)-1924
D & M L Co	Sumner	4	1g	1913-1921	Ozette T Co	Hartford	11	1g 2r	(1921)
Pacific States L Co	So Prairie			1911-1913	Polson Lg Co	Kapowsin	11	1g 2r	(1921)
Seattle Southeastern Ry	Cedar Falls	46	3r 3g	1905-1939	Airplane Spruce & L Co	Raymond	13	3g	1909-1931
Packwood Lg Co	Cedar Falls	14	2r	1906-(1913)	Bloedel-Donovan L Mills	Sekiu	150	12	1923-1945
Paradise Lake Ry & M Co	Woodinville	1		(1901)	Goodyear Lg Co	Sekiu	14	2g	1915-1923
J H Parker Lg Co	Hartford	1	1g	1908-1909	Clallam Bay & Southern RR	Sekiu			(1925)
Pe Ell L Co	Pe Ell	14	2g	1926-1931	Rayville Shingle Co	Elma	2		(1912)
Pe Ell Sawmill	Pe Ell	4	1r	(1907)-1908	Chas E England	Castle Rock	5	2g	1908-1912
Pearce & Balch Mill	Centralia			1916	Red Cedar Shingle Co	Castle Rock	4	2g	1905-1908
Pelton-Armstrong Co	Cathlamet	7	2g	1901-1912	H E Reed Lg Co	Rochester	1	1r	(1908)
PENINSULAR RY CO (Simpson T Co)	Shelton	50	6r	1895-present	Reliance L Co	Morton	1	1g	1928-1929
Washington Southern RR	Shelton	30		1890-1895	Excelsior L Co	Alder	8	1g	1909-1918
Satsop RR Co	Shelton	14	3r	1885-1890	Fred C Duke	Alder	1	2	1908-1909
Stimson M Co	McCleany	31	2g 1r	1916-1926	J F Res Lg Co	Cowlitz Cnty	3		(1909)
The Blakely Road	Kamilche	50	3g 6r	1896-1916	Richardson & Ring	Monroe	4		1909-1911
Puget Sound & Grays Harbor RR	Kamilche	32	1r	1886-1896	T M Ring Lg Co	Monroe	4	1g	1909
Little Skookum & Chehalis RR					Riley Bros	Port Townsend	3	1g	(1906, 1907)
A P Perry L Co	Rainier	6	1g	1911-1922	River Lg Co	Hoquiam	8	1g	1923-1926
Clear Lake Lg Co	Rainier	5	1g	1915-1919	Riverside T Co (Schwager-Nettleton M)	Hood Canal	16	1g	(1907)-1918
Lawrence M Peters	Randle	5		1951-1953	Robe & Menzel L Co	Granite Falls	4	2g	1906-1909
W H Peters Lg Co	Onalaska	10	2g	1924-1926	Robe L Co	Robe	3		1931-1938
Rob W Peterson	Woodinville	4	1g	(1907-1913)	Roberts Lg Co	Elma	1		1926-1927
Phoenix Lg Co	Hoodsport	41	5g	1900-1939	Seki				1902-1905
Ping Pong RR (Elma Shingle Co)	Elma	2	1	(1910)-1916	Reliance L Co	Allyn	5	1	(1927)
Hamilton Pitcher Co	Napavine	3	2g	1901-1911	Excelsior L Co	North River	3		1901-(1902)
Great Southwestern RR	Napavine	5	1r	(1910)-1911	Fred C Duke	Alderson	8	1g	1915-(1917)
D J Platt & Co	Frances	1	1g	1909-1912	J F Res Lg Co	Eatonville	2	1r	1910-1920
Pope & Talbot	Port Gamble	52	4	1936-1939	Richardson & Ring	Eatonville	4	1r	(1907)-1910
Chas R McCormick L Co	Port Gamble	30	2g	1925-1936	T M Ring Lg Co	Stevenson	11	3	1934-1938
Puget M Co (1) (Pope & Talbot)	Port Ludlow	5		1932-1936	Rose Point Lg Co	Stevenson	5	2g	(1915)-1934
Union Riv Lg RR Co (1) (Puget M Co)	Castle Rock	15	1g 1r	1930-1936	O A Rosendahl	Port Ludlow	1	1g	1915-(1917)
West Fork Lg Co	Union	40	2g 1r	1925-1936	Royce L Co	Eatonville	2		
Discovery & Quilcene RR	Union	5	2g	(1889)-1925	Taylor-Royce Co	Eatonville	4	1r	
Port Angeles & Pacific RR	Port Angeles	60	5	1903-1907	Ryan Lg Co	Stevenson	11	3	
Port Angeles Westn Ry (11)	Port Angeles	36		1925-1951	Ryan-Allen LCo (1)	Stevenson	5	2g	
Clallam County RR (Spruce Prod Div #I)	Port Crescent			1918-1925	John Ryan & Co (4)	Port Ludlow	1	1g	
Seattle, Pt Angeles & Western Ry Co (Milwaukee Road)	Port Angeles	38		1915-1918	Saginaw T Co	Aberdeen	40	2g 5r	1909-1947
Seattle, Pt Angeles & Lk Crescent Ry (11)	Port Angeles	23		1914-1915	Grays Harbor & Pac RR Co	Aberdeen	9		1930-1933
					E H Lester Lg Co	Montesano	2	1g	1909-1919
					Saginaw Southern Ry Co	Aberdeen			1913-
					ST REGIS PULP & PAPER CO	Tacoma	23	4	1943-present
					West Fork Lg Co	Mineral	25	4g 1r	1911-1955
					St Paul & Tacoma L Co	Tacoma	120	6g 3r	1887-1949
					Nooksack T Co	Deming	12	2g	1922-1929
					Natches Pass RR Co	Buckley	11	1g 1r	1896-1909
					White & Columbia Rivers RR Co	Buckley			1893-1896

Name	Location	Mile- age	Locomo- tives	Dates	Name	Location	Mile- age	Locomo- tives	Dates
Tacoma, Orting & Southeastern Ry (12)	Orting	11		1889-1893	Stetson & Post L Co	Maple Valley	8	2g	(1917)-1927
Tacoma Southern	Orting			1888-1889	Stevenson L Co	Stevenson	1		1923-1924
Saldern Lg Co	Grays River	8	1g 1r	(1899)-1908	Stimson M Co	Marysville	26	2g 3r	1890-1926
Salmon Creek L Co	Olympia	2		1909-1912	Bryant L & Shingle Co	Bryant	5		(1903)-1904
Samish Bay L Co	Bellingham	10	2g	1912-1929	Marysville & Northern Ry	Marysville	26	2g 1r	1904-1922
Peter Sandberg	Tacoma	1		(1913)	Stimson T Co	Belfair	10	2g	1914-1933
Sara Lg Co	Ridgefield	9	2r	(1901)-1911	Ulmer Stinson	Snohomish	2		1882-(1890)
Sauk River L Co	Darrington	35	4g	1924-1952	Stone Bros	Tenino	3	1	(1906)
Schafer Bros Lg Co	Aberdeen	155	9g 7r	1913-1955	C E Stone L Co	Ridgefield			1911-(1913)
Chehalis Cnty Lg & T Co (Grays Harbor Comm'l Co)	Montesano	13	3g 1r	1902-1923	Storey T Co	Tacoma	14		1912-(1914)
Sylvia Shingle Co	Montesano			(1904, 1912)	Sultan Ry & T Co	Sultan	20	5g	1902-1941
Montesano & Northern RR	Montesano	10	2	(1910, 1913)	Standard Ry & T Co	Hazel	12	3	1906-1913
Independence Lg Co	Aberdeen	22	4	1920-1927	Sumner L Co	Sumner	5		(1887, 1889)
Wilson Bros Co	Aberdeen	10	2g 1r	(1907)-1920	Superior Log & Spar Co	Onalaska	3	1g	1920-1924
National L & Mfg Co	Elma	25	2g 2r	1913-1927	(Multnomah L & Box Co)				
Washington-Ohio L Co	Hoquiam	1		(1908)-1913	Swan L Co	Tolt	10	1g	1931-1947
Wynoochee T Co	Hoquiam	16	4r	1916-1924	Swan & McKay Lg Co	Tolt	5	1g	1927-1931
Schmidt Shingle M	Shelton	2	1g	(1921)	Stillwater L Co (1)	Fall City	4		(1906)-1927
Schwager & Nettleton L Co	Bothell	7		(1907)-1912	Syverson & Hill	Adna	1g		1913-
Scott Bros Lg Co (3)	Concrete		1	(1923)	Syverson L Co	Tacoma	127	12	(1902)-1913
Seattle & Inland RR	King Cnty		1r	(1900)	J F Hart & Co	Tacoma	3		(1887)-1890
Seattle & Northern Ry Co (14)	Anacortes	36		1888-1900	Tacoma, Olympia & Grays Harbor RR Co (12)	Centralia	32		1891-1892
Seattle-Issaqua Elec Ry	Seattle	5		(1913)	Tacoma Olympia & Chehalis Valley RR	Centralia	32		1888-1891
Seattle Cedar L Co	Seattle		1g	(1901)	(Ellsburg Lg Road)				
Seattle, Lake Shore & Eastern Ry Co (12)	Seattle	119	16	1885-1892	Tacoma Shingle Mfg Co	Raymond	3	1	1900-
Seattle Lg Co	Port Crescent	8	2g	1888-(1903)	Tanwax & Western RR	Kapowsin	5	2r	1907-1919
Seattle L Co	Bremerton	4	1g	1902-1916	Storey T Co				
Seattle Supply Co	Bellevue			(1910)	Taylor M Co	Bellevue	4	1g	1909-1916
Securities Lg Co	Tolt		1g	1924-	Rainier Beach Lg Co	Bellevue	4	1g	(1907)-1909
Security T Co	Everett	7	1g	1928-1938	J S Taylor	Lk Sammamish	1		1893-
Alpine L Co	Skykomish	4	1g	1920-1928	C A Taylor L Co	Kelso	1g		(1906)
Nippon L Co	Skykomish	3	1g	1918-1920	Teanaway Lg RR	Cle Elum	20	2r	1916-1919
H O Seiffert L Co	Everett	2		(1910)	(A Guthrie & Co)				
Severson L Co	McMurray	1		1925-1926	Tenino L Co (1)	Tenino	1	2	1905-(1919)
Seymore-Kahaley Lg Co	Snohomish			1910-1912	Thorndike Bay Lg Co	Poulsbo	2	1	1925-1926
Shebelin RR Co	Cowlitz Cnty	2		(1909)	Tongue Point L Co	Longview	3	1g	1906-1908
Shelton Lg Co	Shelton	2	1	1909-(1913)	Three Lakes L Co	Snohomish	16	3g	1904-1921
Shelton South Western Washington Ry	Shelton	12		1898-1903	Sterling M Co	Snohomish	5	1g	1902-1904
Shelton Southwestern RR	Shelton	15	2	1892-1898	Panther Lake Co	Snohomish	16	3g	1921-1930
Mason Cnty Central RR	Shelton	20		1886-1892	Washington Western Ry	Snohomish	12	2	1912-1930
Sherman Bros L Co	Castle Rock	1		1923-1926	Trap Creek Lg Co	Menlo	8	2g	1916-1928
Sherman L Co	Olympia			1909-	Trout Creek Lg Co	Index	7	1g	1923-1926
Allen & Sherman L Co	Olympia	3	1g	(1907)-1909	Turlo L Co	Robe	3	1r	1930-1938
Allen's Mill RR	Olympia		1	(1902)	Turvey Bros Lg Co	Tenino	16	1g 1r	1917-1933
E C Shevelin T Co	Kalama	2	1g 1r	1908-(1915)	Skookum L Co	Tenino	14	1g 2r	1916-1929
Shevelin-Ducey Co	Kalama	1	1r	(1907)-1908	Blumauer L Co	Tenino	6	1g	1906-1916
Siler Lg Co	Monroe			1923-1931	Skookum Ry & Lg Co	Tenino	15	2r	1916-1929
(Port Blakely M Co)	Monroe	17	1g 1r	1910-1923	Tyee Lg Co	Conway			(1904, 1905)
Florence Lg Co	Monroe			1905-	Ulticran & Rosencrantz T Co	Centralia	2	1	1925-1926
(Port Blakely M Co)	Monroe	17	1g 1r	1910-1923	Union City Lg Co	Union	4	1g	1926-1927
Harry Siler	Monroe			1906-(1910)	Union Mfg Co	Lynden	2	1	1910-1912
Siler M Co	Raymond	1		1924-1929	United M & T Co	Darrington	4	1r	(1907)-1913
Silver Falls Lg Co	Elbe	4	2g	1904-1925	Valley M Co	Monroe	12	2g 2r	1902-1927
Silver Lake Ry & T Co	Castle Rock	12	2g 1r	1895-1959	Veness & Baldwin	Stevens Bros	2		
Simpson Lg Co	Shelton	70	3g 4r	1935-1939	Wabash L & Shingle Co	Centralia	1		1913-1914
Siverson Bros	Newman Lake	5		1908-1940	Salzer Valley L Co	Centralia	3	1g	1904-1913
Skagit Lg Co	Lyman	15	2g	1926-1938	Geo. Wagner L Co	Monroe	12	2g	1918-1933
Basin Lg Co	Skamania	6	1g	1918-1923	Wagner & Wilson, Inc	Monroe	10	3g	1906-1918
Greenleaf L Co	Skamania	7	1g	1923-1926	Stevens Bros	Monroe	8	1g	1902-1906
Skamokawa T Co	Skamokawa	6	1g 1r	1921-1926	Waite (Bros) M & T Co	Granite Falls	20	2g	1909-1926
Skewis L Co	Kapowsin	2		1908-1912	Wall L Co (1)	Amboy	8	1g	1923-1928
Slade-Wells Lg Co	Aberdeen	5	1g	1915-1917	Etna Lg Co	Amboy	8	1g	1917-1923
S E Slade L Co	Aberdeen	9	3	1905-1915	Harvey M Co	Amboy	2		1915-1917
Mack Lg Co	Aberdeen	6	1r	(1897)-(1905)	Wallace Falls T Co	Gold Bar	20	3g	1921-1941
Slosson Lg Co	Mt Vernon	4		1912-(1913)	Wallace L & Mfg Co (2)	Sultan	12	3g	(1907)-1936
E D Smith				1883-	Walsh L Co	Orient			
Kay Smith	Brinnon	9	2g	1920-1927	Walville L Co	Pe Ell	7	2g 1r	1908-1931
Upper Sound Lg Co		6	1g	1915-1920	Walworth & Neville Mfg	Pe Ell	3	1g 2r	(1905)-1908
M R Smith L & Shingle Co	Moclips	12	1g 1r	1922-1938	Warnick L Co	Pe Ell	2	1g	1926-1936
Snohomish Lg Co				1901-1919	Glacier L Co	Glacier	1		1922-1925
Snoqualmie Falls L Co	Snohomish	15	4g	1917-1942	Warren Lg Co	Raymond	1		(1910)
(Weyerhaeuser T Co)	Snoqualmie	100	2g 4r	1917-1942	Washington Fir L Co	Winlock	8	2g	1918-1926
Snoqualmie Lg Co		4		(1913)	Washington L & Spar Co	Darrington	4	22g	1921-1927
Snoqualmie M Co	North Bend		1r	1890-	Washington Mfg Co	Fairfax	3	1r	(1910)
Snow Creek Lg Co	Sequim	18	3g	1914-1926	Washington M Co	Seabeck	2		(1887, 1889)
Sequel Lg Co	Sequim	2	1g	1908-1914	Washington Northern RR Co	Prindle	20	2g	1912-1918
Snow L & Shingle Co	Chehalis	12	2g 1r	1914-1929	(Blazier Lg Co)				
Snowden L Co	Klickitat	2	1g	(1928)	Cape Horn RR Co	Washington Ry	4		1908-1912
Snowdon Ousley Lg Co	Eldon	5	1g	(1910)	(Ore & Wash Lg Co)	Allyn	2g		
Sobey Mfg Co	Granite Falls	7	2	1909-1912	Washington Veneer Co	Shelton	5		1921-1931
Soule Lg Co	Frances	1		1902-1911	(Weyerhaeuser T Co)	Darrington	5	1g	1906-(1913)
The Sound T Co	Darrington	38	3g	1916-1942	(Georgia-Pacific Corp)		50	3	1941-1947
(Weyerhaeuser T Co)				Washougal RR	Washougal				1947-1952
Soundview Pulp Co	Hamilton	6	2	1937-1951	Webb Lg & T Co	Brinnon	20	3g	(1887)
Lyman T Co	Hamilton	15	4g	1905-1937	Weeks & Co	North Bend	8	1g 1r	(1907, 1913)
South Fork L Co	North Bend	2	1r	1908-(1913)	Weist Lg Co	Coweehan	1		1911-
South Prairie L Co	South Prairie	3	1g	1925-1926	Welbon Bros L Co	Snohomish	1	1r	1920-1923
South Tacoma M Co	South Tacoma	7	1g	(1907, 1913)	Wenatchee Southern Ry Co	Wenatchee	11		1922-1931
Spring Hill L Co	Issaquah	1		1935-1942	Wentworth Lg Co	South Bend	2	1g	1908-1915
Standard Box & L Co	Stella	6	2	(1910)	Wentworth & Cole	South Bend	1		1907-1908
Standard L & Shingle Co	Clipper	5	1g	(1906, 1910)	West Coast T Co	Everson	3		(1907)-1908
Star M Co	Battleground			West Fir Lg Co	Olympia	4	1g	1929-1932	
Stearns Lg Co	Carlisle	5	2g	1918-1922	West Pacific Lg & L Co	Stevenson			(1916)
Steelman Lg Co	Skamokawa	1	1r	1921-1940	Western Crossarm & Mfg Co	Centralia	14	2g	1925-1930
Stephens-Bird Lg Co (2)	Monroe	15	3g	1907-1926	Western Lg Co	Ocosta	6	1g	(1940)-1941
High Rock Lg Co	Monroe		2g	(1909)-1912					
Forks Lg Co	Monroe	9	2g	1905-1912					
Pendleton & Gilkey	Monroe	6	2	1903-1905					
Pendleton & Fifield	Monroe			1901-1903					
Sterling M Co	Rochester	2	1	1909-					
H A Hawkins	Napavine	2	1r	(1907)-1909					

Name	Location	Mile- age	Locomo- tives	Dates	Name	Location	Mile- age	Locomo- tives	Dates
Western T Co	Winlock	5	3g	1916-1919 (1913)	Larsen T Co	Marshfield	2	1g	(1908)-1909
Western Washington Lg Co	Vaughn	2			Beaver Lg Co	Quincy	5	1g	1909-(1910)
Westport Lg Co	Shelton	10	2g 2r	(1906)-1911	Joe Erickson & Son	Quincy	2	1g	1906-1909
WEYERHAEUSER CO	Morton		1g	(1912)	Beck & Hess	Camas Valley	18		1944-1947
	Longview	194	12	1929-present	Roy A Beebe	Leona	5	2g	1927-1933
	Vail	125	4g 8r	1927-present	A W Bell L Co	Wemme	2	1	1929-1943
Weyerhaeuser T Co	Enumclaw	100	5g 1r	1949-1953	Benson Lg & Lumbering Co	Clatskanie	16	4g 1r	1903-1936
White River L Co	Enumclaw	100	5g 1r	1902-1949	Clatskanie & Nehalem RR		8	5	1904-1908
North Coast T Co	Alder	14	1g 2r	1905-1916	Berst & Cox Lg Co	Timber	1	1g	(1916)-1918
Weyerhaeuser T Co	Montesano	65	2g 4r	1936-1947	Best & Laird	Bandon	1		1928-
Clemons Lg Co	Montesano	75	4g 3r	1919-1936	Best L Mfg Co (4)	Philomath	1	1	(1931)
(Weyerhaeuser T Co)					Big Creek & Telocaset RR	Pondosa	11	2	1928-1959
C H Clemons Lg Co	Montesano	13	3g	1903-1919	(Templeton L Co)				
Melbourne & North River RR	Montesano	8	2g	1903-1919	(Collins Pine Co)				
Whatcom Cnty Shingle Co	Blaine	4	1r	1908-1917	(Grand Ronde Pine Co)				
Wheeler-Osgood Co	Wickersham	5		1909-1912	(Stoddard L Co)				
Whipple Creek Lg Road	North Bend	9		1923	Big Lakes Box Co	Klamath Falls	22	1g	1926-1944
A E White	Woodland			(1907)	Blue Lake Lg Co	Cochran	18	2g	1927-1938
White Bros	Olympia	2		1911-(1912)	Blue Mountain RR	Meacham	6	1g	(1907, 1912)
White Star L Co	McCleary	2	1g 1r	1908-1911	(Hilgard L Co)				
Whitlatch L Co	Elma	10	2g 1r	1905-1937	Blue Ridge RR	North Bend	10	1g	1900-(1912)
Whitman Cnty L Co	Farmington	2	1g	1927-1929	(North Bend Mills)				
Codd & Allen	Farmington	2	1g	1926-1927	Bohemia L Co	Culp Creek	3	1g	1915-1947
Wickersham Lg Co (1)	Wickersham	4		(1916)-1943	Row River L Co	Culp Creek	1	1	1910-1915
W C Wicks	North Bend				Bonlokke & Nelson	Yamhill	5	1g	1927-1934
Wikstrom Lg & T Co	Ilwaco	1	1g	(1923)	Booth-Kelly L Co	Springfield	35	3g 3r	1902-1945
Wilbur Lg Co	Woodinville	2	1g	(1907)	Bowman-Hicks L Co	La Grande	65	4g 3r	(1905)-1936
Willapa Harbor L Mills (Weyerhaeuser T Co)	Raymond	66	6g 1r	1931-1942	Geo Palmer L Co	La Grande	38	4g	1907-1922
Sunset T Co	Raymond	21	2g	1915-1931	Bradley-Woodard L Co	Bradwood	11	3g	1931-1940
Lewis Mills & T Co	South Bend	5	1g	1922-1931	Bramhall L Co	Haley Sta	3	1g	1910-
South Bend Mills & T Co	South Bend	6	2g	1909-1921	Northwest Log & L Co	Barton	3	1r	1906-1910
Willapa Lg RR Co	Raymond	56	2r	1931-1944	Braymill White Pine Co	Braymill	8	2g	1927-1933
Willapacific Lg Co	Raymond	1	1g	1931-1933	Breweld Pine Co	O'Brien	1		1947-1951
T H Williams & Co	Snohomish	8	1g	(1906, 1913)	Bridal Veil Lumber Co (2)	Palmer	16	3r	(1898)-1941
F F Williamson	Shelton	20	1r	(1886)-1900	Gordon Crk & Palmer RR	Palmer	4	1g	1924-
Wilson & McRae Lg Co	Maple Falls	9	1g	1924-1926	Briggs L Co	Umpqua	18		1936-1938
Wilson & Olsen	La Center	1		(1902)	Brighton Mills Co	Brighton	7	2g	(1915)-1927
C H Wilson L Co	Deming	1g		1935-1937	Brix L Co	Holbrook	16	4g 2r	1926-1940
Wind River L Co	Carson	10	1g 2r	1912-1926	B-W T Co	Jewell	15	3g 3r	1927-1929
Windsor, McDonald & Co	Bothell				Brix L Co	Astoria	8	2g	(1899, 1913)
Winkelman L Co	So Prairie	5	1r	(1905)-1911	Brooks-Scanlon L Co	Bend	100	1g 5r	1915-1956
Winlock-Toledo L Co	Winlock	19	5g	1929-1932	Brown L Co	Cottage Grove			1906-
Winlock & Toledo Lg & RR Co	Winlock	25	3g	1923-1929	Delbert Burnham	Rainier	1		1952-1956
Winlock Lg Co	Winlock	8	2g	1916-1923	Butler Lg Co	Elsie			1937-1938
O'Connell L Co (7)	Winlock	16	3g 2r	1906-1916	Butte Creek L Co	Scotts Mills	2	1g	1928-1933
Winlock L Co	Winlock	5	2g	(1906, 1907)	Butte Falls L Co	Butte Falls			(1913)-1918
Winslow L Co	Colville	20	1g	1910-1934	Calif & Oregon Coast RR	Grants Pass	15	3	1913-1954
Colville & Eastern Ry Co	Colville	20	1g	1906-1910	Grants Pass & Eureka RR				
Winston L & T Co	Chehalis	6	1g	1929-1940	Grants Pass & Crescent City RR				
Wisconsin Lg & T Co	Stella	17	3g 1r	1906-1923	Calif Oregon & Eastern Pacific Interior RR				
Benson Lg & L Co	Stella	20	7g 1r	1891-1906	Grants Pass & Western Ry				
Wisconsin L Co	Chehalis	6	1g 1r	1904-(1913)	Oregon Coast RR				
F W Wonn	Nagrom	1	1r	1926-1927	Calif & Ore L Co	Brookings	30	3g 1r	1916-1925
Wood-Acme Lg Co	Acme	3	2g	1938-1940	Brookings T & L Co	Brookings	6	2g	1914-1916
Wood-Knight Lg Co	Bellingham	5	3g	1920-1936	Cameron-Hogg L Co	Bull Run	4	1g	1918-1927
Woodinville L Co	Snohomish	5	2g	1906-1912	Cameron L Co	Kings Valley	8	1	1924-1928
Workman Creek Lg Co	Elma	5	1g	1923-1927	Campbell & Swigert	West Fork	3	1r	(1907)-1913
Bale Lg Co	Hoquiam	4	1g	(1915)-1923	Carlton & Coast RR	Carlton	30	4g 2r	1913-1939
Yakima Sash & Box Co (4)	Naches	3	1	1929-1930 (1908)	(Flora Lg Co)				1921-1939
Yale-Columbia L Co	Yale				(Carlton Consol L Co)				1911-1921
Yeomans L Co	Pe Ell	8	1g 1r	1903-1931	Carlton & Washington RR	Carlton	16		1911-1913
Pe Ell & Columbia River Ry Co	Pe Ell	7	1r	1909-1919	Carter Lg Co	Myrtle Point	2		-1924
Young-Johnson L Co	Kapowin	1		1909-(1913)	Cascade M RR	Cascade Locks	2		(1887, 1891)
Young Bros	Castle Rock	3	1r	(1900, 1902)	Case L Co	Rainer	2		(1908)
Yuill & Allen	Sumas	1		(1907)-1908	Central RR of Ore (Blue Mtn L Co)	Union	19	3	1906-1927
					Geo H Chaney Lg Co	Coquille	7	1g	1910-1933
					Chesapeake & Ohio	Clatskanie	10		1922-1926

OREGON

Name	Location	Mile- age	Locomo- tives	Dates	Christensen Lg Co	Kerry	4	1	1924-1926
Aagard L Co	Glenwood	2	1g	1920-1923	Clackamas	19	1	1929-1940	
J L Aasen	Coquille	3	1g	1923-1926	Portland Southern Ry Co	Clackamas	14	1	-1929
Schroeder & Aasen	Coquille	2	1r	1920-1923	Clackamas Flr L Co	Beaver Creek	2	1g	1929-1939
Aasen Bros (2)	Coquille	2	1g 1r	1898-1920	Clark & Wilson L Co	Linton	98	7g 5r	1905-1943
Ackley Bros (6) (39)	Keno			1917-(1936)	Goble, Nehalem & Pac Ry (Columbia T Co)	Goble	12	3g 1r	1902-1923
Addison L Co	Lorane	3	1g	1931-1941	Goble & Nehalem RR Co	Goble	6		1901-1902
Albany L Co	Albany	2		1916-	Read & Pelton	Goble			1905-1907
Algoma L Co	Klamath Falls	30	1g 2r	1903-1943	Nehalem T & Lg Co	Scappoose	5		(1904)-1926 (1910)
Allen & Murphy L Co	Grant County			1920-1921	Clark's Sawmill	Oregon City			
O R Menefee L Co	Grant County			-1920	E H Cline	Marshland	1	1g	(1907, 1910)
Anderson & Middleton L Co	Cottage Grove	10	2g	1923-1928	Coast Range L Co	Mabel	13	2g	1911-1926
J H Chambers L Co	Cottage Grove	22	3r	1911-1923	Sunset L Co	Mabel	2	1	(1910)-1911
Chas Anderson	Willamina	1		(1928)	Coats Driving & Boom Co	Tillamook	15	2g	1915-1943
C C Arney	Scappoose	3	1	1934-1936	Cochran & Southern RR Co	Cochran	2	1	1924-1933
Astoria & Columbia Riv RR	Astoria	100	9	1896-1907	James Cole	Summit	3	2g	1919-1921
Seashore RR	Astoria	17	1	1893-1896	Devitt L Co	Summit	2	1g	1918-1919
Astoria & Portland RR	Astoria	16	1	1892-1893	E S Collins	Molalla	3		1937-1938 (1906)
Astoria & South Coast RR	Astoria	16	1	1888-1892	Columbia & Nehalem Lg Co				
Astoria Southern Ry Co (Tidewater T Co) (Western Cooperage Co)	Astoria	27		1910-1943 1923-1943 1910-1923	Columbia City & Nehalem RR	Columbia City	1		1903-(1904) (1903) (1899, 1904) (1910)
Astoria T & L Co	Holbrook		1g		Columbia Riv & Nehalem RR	Tillamook Cnty			
Balderee & Ritner Lg Co	Yaqquina	3	1g	1929-1930	Henry Colvin	Marshland			
R G Balderee Lg Co	Salem	5	1g	1920-1946	Colwell & Fowler Lg Co	Astoria	2	1g	
Baldridge Lg Co	Reedsport	3	2g	1931-1938	CONDON, KINZUA & SOUTHERN RR (Wheeler T Co)	Kinzua	27	1g	1927-present
Ball L Co	Glide	2		1950-1951 (1920)	(Kinzua Pine Mills)				
Bay Park L Co	North Bend				Connacher Lg Co	Vernonia	14	2g	1924-1941
Bear Creek Lg Co	Kerry	6	2g	1916-1922	Consolidated T Co (42)	Glenwood	100	8	1934-1944
Beaver Creek Lg Co	Vernonia	4	1g	1922-1925	Coos Bay Lg Co	Coos Bay		1g	1900-(1907)
Beaver Hill T Co	Marshfield	3	2g	1909-	Coos Bay Lg Co	North Bend	5	3g	1920-1942

Name	Location	Mile-age	Locomo-tives	Dates	Name	Location	Mile-age	Locomo-tives	Dates
McDonald & Vaughan Co	North Bend	12	2g	(1913)-1920	Green Mountain Lg Co (Dollar-Portland L Co)	Kerry	2	2g	1922-1927
Simpson L Co	Daniels Crk	10	1g	(1898)-1916	J P Guerrier L Co	Buckner	1		1925-1926
Blue Ridge Ry & Nav Co	Daniels Crk	10	1	-1909	Hadsall Creek Lg Co	Mapleton	3	1g	1931-1933
Coos Bay, Roseburg & Eastern RR & Nav Co (10)	Marshfield	31	4	1891-1915	Hammaker & Hild	Lakeview	5		1939-1940
Isthmus Ry (6)	Marshfield			1874-1890	Hammond-Tillamook L Co	Garibaldi	20	3g 1r	1927-1936
Coos Bay T Co	Marshfield		1g	(1909)	Hammond L Co	Astoria	18	2g 6r	1895-1927
Coos Cedar Co	Coquille	2	1g	1923-1935	Oak Point RR	Astoria	5		1913-
Crivallis & Alsea Riv Ry (18)	Corvallis	7	1g	1908-1911	Continental L Co	Garibaldi	12		1927
Corvallis Lg Co	Monroe	15	2g	1920-1939	Whitney Co	Kerry	3	1g	(1923)
Corvallis L & Mfg Co	Corvallis	4	1g	1915-1920	L B Hanna T Co	Cherry Grove	6	1g 1r	1915-1928
Crater Lake Box & L Co	Sprague Riv	15	1r	1938-1942	Haskell-Carpenter Co	Westlake	4	1g	1931
Crater Lake L Co	Sprague Riv	14	1r	1931-1938	Herren Lg Co	Booth	2	1	1934-1942
Crooked Creek L Co	Lakeview	1		1926-(1927)	Hills Creek L Co	Jasper	1		1931-1942
Crown T Co	Mapleton	2		1926-	Hillsboro Lg Co	Buxton		1g	(1899)
Crown Zellerbach Corp	Seaside	30	3g	1928-1937	EDWARD HINES L CO	Hines	74	2g 3r	1928-present
Crown Willamette Paper Co	Seaside	30	4g 2r	1914-1928	OREGON & NORTH-WESTERN RR	Hines	51	3r	1928-present
Willamette Pulp & Paper	Seaside	4	1g	1903-1914	Malheur RR	Burns	51		1924-1927
Crown Columbia Paper	Astoria			1890's-1914	(Herrick L Co)				
Culver L Co	Lakeside	7	2g 1r	1929-1930	Edward Hines L Co	Westfir	20	3	1946-1956
Dallas & Ellendale Ry	Dallas	5	1g	1891	Westfir L Co	Westfir	20	1g 2r	1937-1946
Dallas L & Lg Co	Dallas	3		(1912)	Hobson Bros	Murphy	7		1940-1946
Davenport Bros	Haynes Spur			(1900)-1905	Henry Hoeck & Co	Marshfield			(1910, 1915)
Dean L Co	Marshfield	2	1r	(1905, 1907)	Hoover L Co	Adair		1g	(1906)
Delta Shingle Co	Florence	4	1g 1r	1918-1926	Horton L & T Co (4)	Hoover	2		-1916
Dixon & Howitt	Cherryville	1		1925-1933	Max H Houser	Horton	17	2	1927-1931
Dollar L Co	Bandon	10	1	(1899)-1916	Hutchinson Lg Co	Warrenton	5		1920-
Lyons-Johnson L Co	Prosper			(1913)-1915	Wilbur Hyland	Newport	18	3g	1928-1936
ROBERT DOLLAR CO	Glendale	2	1g 1r	1931-present	Inman-Poulsen L Co	Noti			(1916)
Eugene L Co	Holley	3	5	1935-1942	Interstate Lg Co	Keasey	8	3g 1r	1923-1930
Ingham L Co	Glendale	12	2	1932-1945	Jacobsen-Reid L Co	Glenwood		1g 1r	1938-1940
Glendale L Co	Fernvale	8	1g 1r	(1908)-1932	Jamestown-Oregon L Co	Rainier	1		1917-1919
Drug & Blachly	Blachly	2		(1910)	Jennings & McRae Lg Co	Alpine	7	2g	1923-1929
Durable Fir L Co	Dorena	35	3	1937-1946	Johnson L Co	Coos Bay	3	1g	1906-(1914)
Dwyer L Co	Boring	7	1g 1r	(1915)-1923	Seeley & Anderson Lg Co	Coquille	2	1r	1902-1914
Dwyer Lg Co	Timber	1	1g	1938-1940	Seeley & Thomas	Coquille	3	1r	1908-1914
East Side Lg Co	Keasey	22	3g	1923-1933	Al V Johnson L Co	Coquille	1	1r	(1907)-1908
Miller-Cox Lg Co	Timber	2	1g	1918-1923	C McC Johnson L Co	Grand Ronde	1	1	1928-1929
Rock Creek Lg Co	Keasey	3	1g	1924-1926	Ralph Johnson Sawmill	Reedsport	3	1g	1921-1928
East Side M & L Co	Sellwood	2	1	1903-(1910)	W W Johnson L Co	Vaughn	8		(1947)
Eastern & Western L Co	Molalla	30	3g 2r	1927-1935	K C L Co	Westport	3	1g	(1908, 1910)
W H Eccles L Co	Austin	15	2g	1911-1926	K-P T Co	Wheeler			(1917)
G S Elder & Sons	Williams	25		1935-1938	Kerry T Co	Kerry	53	9g 7r	1925-1938
Elliott & Elwood Lg Co	Olney	3	1g	1918-1919	Columbia & Nehalem River RR	Kerry	6	3g	1915-1925
Veness & Malone	Olney			1916-1918	Clatskanie				
Elrod & Wills	Reedsport			1929-	Harrisburg				
Elwood L Co	Buxton	5	1g	1928-1941	D L Kelly L Co	Warrenton	4	1g	1905-(1910)
Elwood Lg Co	Kerry	2	1g	1919-1928	Flavel L & Shingle Co	Warrenton			
Elwood & Snow	Birkenfeld	1	1g	1916-1919	Kesterson L Corp	Klamath Falls	25	2	1930-1941
England & Cyphers	Gaylord			(1906)	Kiernan-Flora Lg Co	Kerry	7	2g	1919-1923
Everding & Farrell	HQ Portland			1905-	Kings Valley L Co	Airlie	1	1g	(1917)-1919
Ewauna Box Co	Klamath Falls	40	2g 1r	1924-1948	Robt C Kinney Lg Co	Astoria	3	1g	1919-1926
Falls City L & Lg Co	Falls City	6	2g	1906-1919	Kinzuia Pine Mills Co	Kinzuia	14	3	1927-1951
Teal Creek RR				(1916)-1919	Kirby L Co	Willamina	2	1	(1928)
Fall Creek M Co	Scappoose	3	1	1929-1931	Klamath Lg & T Co	Odessa	4	1g	(1917)-1919
S M Feazle Lg Co	Cochran	1	1r	1930-1941	KLAMATH NORTHERN RR	Gilchrist	11	1	1938-present
Fire & Pine L Co	Glendale	4	2g	1919-1920	(Gilchrist T Co)				
Fir & Spruce L Co	Toledo	3	1r	1909-(1912)	Klamath T Co	Klamath Falls	2		(1942)
Fir L Co	Cottage Grove			1910-	Knappa Lg Co	Knappa	7	2	(1942)
Fir Tree L Co	Scappoose	12	3	1910-(1911)	Knappton Lg Co	Holbrook	3	1g	1924-
Chapman T Co	Scappoose	12	3	-1910	Sorenson & Wiest Lg Co	Holbrook	3	2g	1922-1924
Pacific & Portland Ry	Scappoose	6	1r	1910-	Hauser Const Co	Holbrook	3	2g	1920-1922
Fischer-Boutin L Co	Glentina	1	1r	(1915)-1919	Grant Smith & Co	Holbrook	3	2g	1918-1920
Fischer-Leitzel Lg Co	Olney	3	1g	1919-1923	Koster Products Co	Astoria	11	3g	1919-1939
Fischer L Co	Marcola	12	2g	1911-1939	Calif Barrel Co	Olney	6	2g	1918-1919
Fisher & Bally	Marcola		1	(1916)	Kramer L Co	Grand Ronde	1	1	1929-1931
Fishhawk Lg Co	Kerry	2	1g	1915-1919	LaDee Lg Co	Estacada	25	1r 2g	1926-1932
Flora L Co	Carlton	20	1g 2r	1923-1940	Porter-Carstens Lg Co	Estacada	1	1g	1923-1926
Carlton Consolidated L Co	Carlton	21	2g	1910-1923	LaDee Lg Co	Kerry	5	3g	1918-1934
Forcia & Larsen	Noti	2	1g	1923-1934	Porter-Carstens Lg Co	Kerry	5	3g	1922-1926
Forest L Co	Chiloquin			(1898)-(1910)	Eastern & Western L Co	Astoria	30	2g 2r	1920-1929
Forest L Co	Pine Ridge	35	3g 1r	1926-1940	Lewis & Clark Riv RR Co	Clatsop	18	2g 5r	1918-1922
J L Goldthwaite L Co	Pine Ridge	15		-1926	Saddle Mtn Lg Co				
Foster Mills, Inc.	Willamina	7	2	1931-1943	Laird & Garrett (3)	Astoria	23	1g 3r	1920-1923
Foster L Co	Willamina	2	1	1925-1931	Lamb T Co	Myrtle Point			1926-1927
Fountain-Campbell L Co	Sprague Riv			1929-	Lamm L Co	Deer Island			1916-
Campbell-Towle L Co	Sprague Riv			-1929	Larkin-Green Lg Co	Mt Vernon	41		1951-1953
G H P L Co	Hillsboro		1g		E G Larkins	Modoc Point	50	1g 1r	1915-1944
Gales Creek & Wilson	Glenwood	16	2r	1917-1943	Larsen T Co	Blind Slough	15	1g 2r	1910-1926
River RR (13)					Laurel L Co (4)	Beaver Creek	3		1928-1929
Gales Creek Lg Co	Glenwood	5	2g	1923-1933	Lawson Creek Lg Co	Coos Bay	2	2g	(1908)
J K Gamble Lg Co	Birkenfeld	3	1g	1916-1919	Lawson Cypress L Co	Hillsboro	1	1	(1931)
Gardiner L Co	La Grande			1926-	Leland L Co	Cushman		1g	(1906)
Gardiner M Co	Gardiner	5	2g	(1906)-1917	Leona Mills L Co	Grants Pass	1	1r	1926-1930
Jewett M Co	Gardiner	4	1g	1917-1927	Lewis & Clark Narrow Gauge RR	Leona	8	2g	1913-1924
A E Gault	Coos Bay	1	1r	(1931)	(Spruce Prod Div #VIII)	Clatsop Cnty	3		1917-1918
Georgia-Pacific Corp	Toledo	12	4r	1951-1959	Lewis-Peters L Co	Dexter	2	1	1929-1933
C D Johnson L Corp	Toledo	48	1g 4r	1922-1951	E F Libke	Astoria	3	1g	1908-(1910)
Pacific Spruce RR Co	Toledo	1		1921-1922	Lincoln County Lg Co	Taft	5	2g	1928-1941
Story & Miller	Toledo	1		1919-1920	Lincoln-Toledo L Co	Toledo	9	2r	1920-
Pacific Spruce Corp	Toledo	60	2g 4r	1920-1935	Fischer-Storey L Co	Toledo	9	2r	1919-1920
Alsea Southern RR	Toledo	27		1918-1920	Yaquna Bay RR & L Co	Toledo	7	1r	1918-1919
(Spruce Prod Dix #XII)					International Paper Co	Vernonia	35	3g 3r	1956-1957
Pac Spruce Northn Ry	Toledo	7		1923-(1924)	Long-Bell L Co	Vernonia	35	3g 3r	1953-1956
Manary Lg Co	Toledo	39	2g 4r	1922-1926	Oregon-American L Co	Vernonia	35	3g 3r	1922-1953
GEORGIA-PACIFIC CORP	Coos Bay	70	3r	1956-present	LONGVIEW, PORTLAND & NORTHERN RR	Grand Ronde	9	2	1955-present
Coos Bay L Co	Coos Bay	75	10g 5r	1908-1956	(International Paper Co)	Reedsport	3		1952-present
Smith-Powers Lg Co	Coos Bay	90	9g 3r	1908-1926	(Long-Bell L Co)				1956-present
C A Smith L & Mfg Co	Coos Bay	28	5	1908-1915					1955-1956
Giustina Bros L Co	Eugene	8	2	1929-1941					
Goble Milling Co	Goble	1		(1908, 1910)					
Gold Hill L & Ry Co	Gold Hill	6	1g	1910-1919					
Grand Ronde L Co	Willamina	1	1g	1927-1928					
Great Western L Co	Black Rock	3	1g	1909-1913					

Name	Location	Mile- age	Locomo- tives	Dates	Name	Location	Mile- age	Locomo- tives	Dates
Willamina & Grand Ronde Ry (Long-Bell L Co) (Miami Corp) (Polk Operating Co) (Ore Coast Range L Co) (Spaulding-Miami L Co)	Grand Ronde	10	2g 1r	1920-1955 1943-1955 1930-1943 1926-1930 1924-1926 1920-1924	OREGON PACIFIC & EASTERN RY (Georgia-Pacific Corp) (Booth-Kelly L Co) (Anderson & Miditon L Co) (J H Chambers L Co) Oregon & Southeastern RR Co	Cottage Grove	28	3r	1914-present 1959-present 1936-1959 1924-1936 1917-1924 1904-1914
Lorane T & Milling Co	Willamina	2r		1919-1920	Cottage Grove & Southern RR		38	2r	1902-1904
Lorane Valley L Co	Gillespie	24	3	1946-1951	Oregon White Cedar Co	Charleston	8	2g	1929-1931
J H Chambers & Son	Cottage Grove	25	6r	1924-1946	Chas B Otey L Co	Chiloquin			1916-1919
Lorenz L Co	Sprague River	12	1r	1929-1931	Owens Bros L Co	Cushman	4	2g	1928-1930
Lulay Bros L Co	Scio	12		1929-1935	Vaughan & Bestor L Co	Cushman	4	2g	(1917)-1928
Lystul-Lawson Lg Co	Glendale	9	1g	1922-1933	Pacific National L Co	Rainier			(1912)
Oregon-Idaho L Co	Glendale	5	1g	-1908	Pacific Pine L Co	Baker	7	1g	1931-
Furbush L Co	Newport	3		(1924)	Cavanagh L Co	Bates	7	1g	1929-1931
M L & B Co	Glenwood	4	2	1931-1933	Pacific Ry & Nav Co (10)	Hillsboro	77	3	1906-1915
Manary-Davis Lg Co	Florence	1		(1947)	Pacific Shalers & T Co	Ashford	10		1928-
Mardock L Co	Nehalem	15	3	1929-1938	Palmer & Libby Lg Co	Albert	2	1g	(1907, 1910)
Markham & Callow, Inc	Svensen	8	2g	1898-1906	Palmer-Rupp Lg Co	Astoria	7	1g	1912-1919
C C Masten	La Grande	7	1g	1913-(1914)	Parker & Sons	Mist	1	1g	1917-1918
Masters-Ewold L Co	La Grande	6		1910-1913	Pelican Bay L Co	Kernville	2		1951
Wileox L Co	Forest Grove	3		1951-1959	F R Pendleton	Alameda	44	3g 1r	1911-1934
C Q Mathewson	Timber	3	1g	1918-1923	J B Miller	Toledo			1916-
McCall Lg Co	St Helens	8		1910-1917	Peninsula L Co	St Johns	27	3g	1900-(1915)
Chas R McCormick L Co	St Helens	8	2g	1907-1910	Columbia & Nehalem Valley RR Co	Columbia City	17	2	1902-1906
Masten Lg & RR Co	Westport	2	1r	1907-1909	Penn L Co	McGlynn	4	1g	1925-1938
McDougal-Nickey Lg Co	Youngs River	7	2g	1915-1918	Peterson & LaDuke Bros	Goldson			(1928, 1929)
McGregor & Malone, Inc	Astoria	4	3	1903-1915	Pine Lg Co	Klamath Falls	1		1931-1933
Bremner L Co	North Bend	3	1g	1929-1933	Pitchless L Co	Bend	1		1917-1919
McKenna L Co	Meacham	4	1g	1906-(1910)	A N Pittcock	St Johns			(1910)
Meacham L Co	Medford	65	3g 2r	1935-1961	Pokegama RR & L Co (Keno RR & L Co)	Aumserville	3		(1947)
MEDFORD CORP	Medford	65	3g 2r	1930-1935	Pokegama sawmill	Keno			1910-
Owen-Oregon L Co		31		1924-1930	Pokegama Sugar Pine L Co	Pokegama			-1910
Medford Lg RR		45	1g 1r	1922-1924	Polk Operating Co	Grand Ronde	21	4g 1r	1897-1902
(Owen-Oregon L Co)		31	2r	1909-1919	Ore Coast Range L Co	Grand Ronde	21	6	1926-1943
Brownlee-Olds L Co		12		1906-1909	Port Orford Cedar Co	Port Orford			1924-1926
Pacific Eastern RR					Port Orford Cedar Prod Co	Port Orford	12	1g	1910-1913
(GN interests)					L B Porter	Svensen	6		1916-
Medford & Crater Lk RR					Sorenson Lg Co	Svensen	6	2g	1901-1916
Menefee L Co	Wendling				Portland & Oregon City RR	Viola	24		(1915, 1920)
Midway L Co	Grand Ronde	2	1	1924-1926	Portland & Southwestern RR	Linnton	20	2g 1r	1905-1943
Mill City Mfg Co	Mill City	20	1g	1929-1940	(Clark & Wilson L Co)				1926-1943
Hammond L Co	Mill City	35	3g 2r	1934-1947	(Nehalem T & Lg Co)				1910-1926
Curtiss L Co	Mill City	10	2g	1910-1934	(Chapman T Co)				1905-1910
C M Miller L Co	Marcola	2	1g	1925-1931	Presley & Hackett	Gold Hill	1	1g	1918-1919
W J Miller (43)	Bellfountain	1	1	1928-1933	Prosper M Co	Prosper	3	1r	(1913)-1924
Milton Creek Lg Co	Yankton	17	2g 1r	1917-1926	Prouty L & B Co	Seaside	3	1g	1918-1923
Fred Minard & Co	Lakeside	1		1920-1925	Quincy Lg Co	Clatskanie	1	1g	(1908)
Modoc Pine Co	Chiloquin	14		1925-1926	Randolph L Co	Bandon	7		1911-(1913)
Williamson River Lg Co	Chiloquin	38	2g	1923-1925	Red Fir L Co	Harrisburg	5		1931-1938
Modoc L Co (2)	Chiloquin	28	2g	1918-1923	Orrin R Reese	Gresham	3		(1942)
Monhawk L Co	Mohawk	4	1g	1918-1924	Rhine Allen L Co	Center			1912-
Moialala L Co	Moialala	8	1g	1930-1934	Roach T Co	Sutherlin	12		1916-1920
Montroe T Co	Pt Terrace			1917-1918 (1916)	L F Roberts	Elkton	1		(1951)
Montgomery Bros	Wendling				Geo Rockey	Rainier	2	1g	1905-(1910)
Moore L Co, Inc	Wallowa	12		1940-1941	Rogers L Co	Prineville	3	1r	1919-
Moore M & T Co	Bandon	8	2g 1r	1910-1934	R H Rosa	Bandon	6	2r	1904-(1910)
Cody L Co	Bandon	3	1g	(1905-1910)	Rogue River Valley Ry (1) (City of Medford)	Medford	6		1919-1930
Lampa Creek RR	Bandon	5	2	(1899)-1916	(Bullis Lg Co)				
Moser Bros L Co (5)	Hoskins	4		1934-1940	Medford-Coast Ry Co				1919
Mt Emily L Co	La Grande	40	3g	1924-1955	Medford-Jacksonville Ry (Ore L & M Co)				1919
Ore White Pine L Co	Enterprise	42	2g 1r	1928-1938	Southern Oregon Traction Co				1916-1919
East Ore L Co	Enterprise	42	2g 2r	1915-1928	Rogue River Valley RR				1891-1916
Enterprise Lg Co	Enterprise	30		1926-1931	Rosenberg Lg Co	Tillamook	25		1950-1953
MT HOOD RR CO	Hood River	22	2	1906-present	W J Ross	Blind Slough	1		1900-
(Eccles, Lighthall) (Oregon L Co)				1906-1952	Rue & Clyde	Goble			1905-1909
Mountain Fir T Co (3)	Lowell	2	1	1928-1931	St Helens T Co	St Helens	12	1g	1909-1915
Mowry L Co	Glenwood	4	1g	1928-1929	Salem, Falls City & Western Ry (10)	Salem	28	5	1906-1915
Multnomah L & B Co	Newport	12	3	1923-1928	Dallas & Falls City RR	Dallas	14	4	1903-1906
Douty L Co	Douty	3	1g	1920-1926	Salem & Pacific Coast RR				1901-1903
Rainier L Co	Reliance	2		1919-1920	Sandy L Co	Sandy	1		1923-1931
Lewis-Malone L Co	Astoria	1	1g	1920-1926	Santiam Ry Co	Silverton			1916-1920
Murphy T Co	Kerry	5		1916-1923	(Willamette Valley L Co & Silverton L Co)				
Deer Island Lg Co	Deer Island	30	3g 2r	(1916)-1928	Schelby Lg Co	Molalla	3	1g	1931-1939
New Grand Ronde L Co	Willamina	3	1g	1926-1943	Scott & Blinn Lg Co	Gaston	10		1944-1947
Nibley-Mimnaugh L Co	Wallowa	18	3g	(1910)-1923	Scranton Lg Co	Isthmus Sl	1		(1889)
Nicolle Bros	Odessa	2	1r	1916	Seaside Door & L Co	Seaside	3		1912-1913
Nine L Co (2)	Klamath Falls	8	2r	(1917)-1926	Seaside L & Mfg Co	Seaside	3	1g	1907-1911
W C Noon L Co	Philomath	5	1r	(1910, 1912)	Seaside Spruce L Co	Seaside	2		1905-1907
North Bend L Co	North Bend	1	1g 1r	1910-(1915)	Seitzinger L Co	Idanha	7		1942-1947
North Pacific Fir & L Co	Kerry	8	2g 1r	(1917)-1925	Shanghai L Co	Devitt	4	1g	1928-1931
Noyes-Holland Lg Co	Rainier	13	9	1905-1923	Shannon & Walters	Elmira	1		(1921)
Portland L Co	Rainier	2	2g 3r	1901-1905	Shaw-Bertram L Co	Klamath Falls	29	3g	1920-1936
Yeon & Peiton Co	Rainier			1890's-1901	Sheridan T Co	Sheridan	1	1g	1914-1918
John Yeon	Marshland	2	1	(1907, 1910)	Sheridan L Co	Sheridan			1912-1914
O.K. (Lg Co) Cable RR	Rainier	1	1g	1906-(1907)	E J Sherman L & Lg Co	Banks	19	2g	1928-1936
M T O'Connell	Coquille	3		(1910)	Shevlin-Hixon Co	Bend	88	6r	1916-1952
Olson Bros	Seaside	3	1g	1915-1919	Silver Falls T Co	Silverton	68	3g 3r	1912-1938
Olson Bros Lg Co	Glenbrook	7	2g	(1908)	Silverton L Co	Silverton	12	2g 1r	1906-1931
Oregon & Wisconsin L Co	Glenbrook	7	3g	1923-(1924)	Sitka Spruce Co	Coquille			1918-1920
Oregon-Jamestown L Co	Glenbrook	7	3g	1919-1924	Skelley L Co	Drain	2	1r	1905-(1909)
Alsea River L Co	Klamath Falls	82	3r	1919-present	Snellstrom Bros L Co	Vaughn	4	1g	1927-1945
OREGON, CALIFORNIA & EASTERN RR (19)					Sorenson Lg Co	Astoria	6	2g	1901-1916
Municipal RR	Klamath Falls	20	1	1917-1919					
Oregon Eastern RR Co (10)	Oakridge	34		1909-1912					
Oregon Export L Co	Marshfield	2	1g	1921-1923					
Oregon L Co	Baker	30	5g 1r	(1900)-1943					
Oregon L Co	Bates		3	1910-1952					
	Dee	25	2g 1r	(1902)-1942					
	Quincy	4	1r	(1907, 1912)					
Fir L Mfg Co	Cascade	2		1918-					
Oregon T & L Co	Clifton	15	2g	1905-1928					
Mann & Montgomery	Clifton			1903-1905					

Name	Location	Mileage	Locomo-tives	Dates	Name	Location	Mileage	Locomo-tives	Dates
Southeast Portland L Co	Boring	25	1	1934-1938	Willamette River L Co	Oregon City	2	1g	1920-1922
Bear Creek Lg Co	Boring	20	3g 1r	1923-1934	Willamette Valley L Co	Dallas	35	4g 3r	1896-1948
Southern Oregon Co (1) (Simpson L Co)	Empire	8	2r	1884-1919	Willamette Valley				
Southern Oregon RR Co				(1890's)	Southern RR (8)	Oregon City	45		1915-1935
Spaulding-Jennings Lg Co	Westport			1901-	Clackamas Southern RR	Oregon City	7		1913-1915
Chas K Spaulding Lg Co	Newberg	20	5g	1906-1938	Williamina L Co	Williamina	2	1	(1931)
Spaulding-Miami L Co	Grand Ronde	21	3g 2r	1921-1924	Williamson River Lg Co	Chiloquin	38	2g	1923-1925
Marys River Lg Co	Philomath	11	2g	1916-1926	Modoc L Co (2)	Chiloquin	28	2g	1918-1923
H E Spencer	Elgin			(1912)	Wilson-Case L Co	Rainier	1		1905-1908
Standard Box & L Co	Scofield	8	2g	1913-1928	H-K Lg Co	Reedsport	8	2g	1920-1936
Standard Lg Co	Cochran	22	4	1938-1944	Wisconsin Lg & T Co	Coos Bay	15	4	1906-(1912)
Star Lg & L Co	Rainier			(1900)	Wolf Creek Lg Co	Timber	10		1930-
E C Steiger	Gold Hill	2		(1912)	W A Woodward L Co	Cottage Grove	14	1g 1r	1925-1942
J J Steiger	Chiloquin			(1916)	Wright-Blodgett Co	Jewell	25	6	1935-1938
Stevens-Farris L Co	Walton	2	1r	1920-1925	Yaquina Northern RR	Yaquina	16	6g	1918-1929
Stimson L Co	Forest Grove	18	3	1932-1952	(Multnomah L & Box Co) (Newport Port Commission)				
Stoddard L Co	Baker	60	8g	1914-1943	(U S Spruce Corp)				
Stoddard Bros L Co	Baker	5	2g	1898-1914	(Warren Spruce Co)				
Baker White Pine L Co	Baker	32	4g	1912-1929	(Spruce Prod Div #XI)				
Grande Ronde Pine Co	Pondosa	35	3g	1930-1943	Yunker & Wicks	Jewell	7		1936-1946
Storey-Keeeler L Co	Cascade Lks		1g	1901-(1902)					
Stoudier Lg Co	Alsea	5		1951-1956					
Stout L Co	North Bend	18	5g 1r	1923-1926					
North Bend M & L Co	North Bend	7	2g	1900-1923					
(Simpson L Co)									
Buehner L Co	North Bend	7	3g	1916-1923					
Surdevant & Crane	Coquille	3	2r	(1907)-1923					
Sugar Pine L Co	Ashland	30		1945-1947					
Summit L Co	Clatskanie	1	1g	(1910, 1912)					
Summit T Co	Cochran			(1915)					
SUMPTER VALLEY RY (Oregon L Co)	Baker	80	11	1891-present					
Sunset Lg Co	Timber	18	3g	1923-1949					
Syverson Bros (3)	Beaver		1	1891-					
The Dalles & Southern RR	The Dalles	40	2	1933-1936					
Great Southern RR (Wasco Pine L Co)	The Dalles	40	2	1904-1933					
Columbia Southern RR									
Thorsen-Hendrickson L Co	Toledo	9		1918					
Tichenor L Co	Clatskanie								
Tide Creek L Co	Deer Island	2		1906-					
Tideport Lg Co	Jewell	22	5g 2r	1928-1933					
Tidewater T Co	Oliney	35	3g 3r	1923-1943					
Western Cooperage Co	Oliney	20	3g 1r	1910-1923					
Tillamook Spruce Co	Tillamook	1	2	1924-1926					
Toledo & Siletz RR Co	Toledo	10	2	1917-1919					
(Fischer-Storey L Co)									
(Bade L Co)									
Toledo-Siletz RR & Nav Co	Toledo			1911-1917					
Toledo L Co	Toledo			(1915)					
Trask-Willamette Co	Carlton	15	5	1935-1941					
Troland Lg Co	Glenwood	3	1	(1942)-1946					
E Turney & Sons	Seaside	2	1g	1919-1920					
H E Noble L Co	Seaside	2	1g	1917-1919					
Umpqua Mills & T Co	Reedsport	6	1g	1924-1934					
United Railways (44)	Linnont	50		1922-1947					
Portland, Astoria &	Linnont	32	5r	1921-1922					
Pacific RR (Ore-Amer L Co)									
VALLEY & SILETZ RR CO	Hoskins	47	3	1916-present					
(Boise-Cascade Corp)									
(Templeton L Co)									
(Cobbs & Mitchell)									
(Siletz L & Lg Co)									
Valsetz L Co	Valsetz		1	1947-1951					
Cobbs & Mitchell	Valsetz	20	4g	1920-1947					
Siletz L & Lg Co	Hoskins	4	2g	1919-1920					
Veness & Shives	Timber	3	1g	1920-1923					
Wallowa Pine L Co	Wallowa			1922-					
Waluskie RR	Astoria	2	1	1886-(1890)					
Warren & Scott (3)	Seaside			(1918)					
Warren Spruce Co	Toledo	13	6g	1918-1920					
(Spruce Prod Div #XI)	Wauna	20	7g 1r	1941-1943					
Wauna L Co	Wauna	32	7g 1r	1912-1941					
Crossett Western Co	Wauna	3		1911-1912					
Columbia Valley L Co	Wauna			1912-1923					
Big Creek Lg Co	Knappa	30	7g 1r	1912-1923					
Weise Bros	Cottage Grove	2	1	1923-1926					
Wells-Laber L Co	Rainier	2		(1912)					
Wentworth Lg Co	Beaver Hill			1918-1919					
West Coast Lg Co	Birkfeld	1	1g	1938-1940					
West Ore L Co	Clatskanie	5	2g	1909-1913					
West Shore L Co	Cochran	2	1g	1930-1933					
Western Cedar Co	Rainier	1	1	(1910, 1912)					
WESTERN LG CO (Georgia-Pacific Corp)	Valsetz	3	2	1944-present					
(Inman-Poulsen L Corp)				1954-present					
Western L & Export Co	Cottage Grove	8	2g	1919-1923					
U S Lg Co	Cottage Grove	6	1g	(1915)-1919					
Western L Co	Westfir	16	2g 2r	1923-1936					
Western White Cedar Co	Marshfield	4	2	1923-1929					
Westport L Co	Westport	5		(1910, 1912)					
The Westport L Co	Kerry	7	2g	1920-1926					
Palmer-Owen Lg Co	Kerry	4	1g	1917-1920					
WEYERHAEUSER CO	Klamath Falls	120	1g 3r	1928-present					
C H Wheeler	Springfield	31	2	1949-present					
Eagle L Co	Cochran	30	5g	1909-1935					
Wheeler L Co	Westimber	6	3g	1913-1926					
E G Whipple	Drain	6	2g	1911-1919					
White Pine L Co	Klamath Falls	2	1g	1944-1947					
Whitten & Bryant	Cochran	3	1g	1920-1931					
Frances Wiest & Co	Cochran	3	1g	(1917)-1926					
Willamette Pacific RR Co	Florence			1920-1923					
(10)									
(Wendling-Johnson L Co)									
				1911					

Name	Location	Mile-age	Locomo-tives	Dates	Name	Location	Mile-age	Locomo-tives	Dates
UTAH									
Geo C Kidder	Park City	Mile-age 2	Locomo-tives	Dates (1887)	Ida White Pine Milling Co	Nampa			(1912)
WYOMING									
Laramie, Hahn's Park & Pacific Ry (54)	Fox Park	Mile-age	Locomo-tives	Dates 1900-1914	Inland Empire Paper Co	Athol	15	1g 2r	1916-1934
MONTANA									
Name	Location	Mile-age	Locomo-tives	Dates	N C Jones T Co	Cambridge	20		(1947)
American T Co	Dayton	10	1g	1938-1940	T H Kerr	Kellogg	10		1925-
Anaconda Copper Mining Co	Bonner	35	8g	1904-1949	Kootenai Lg & RR Co	Harrison	5	1g	1908-1916
Big Blackfoot Milling Co	Bonner	27	2g	(1900)-1915	(Lane L Co)				
Big Blackfoot Midland RR	Bonner	30	2	1903-1915	Lewiston L Co	Orofino	6	1g	1908-(1911-1913)
Western L Co (1)	Bonner	10	2g	1912-1928	MacGillis-Gibbs L Co	Clark Fork	4		1905-1946
W H Best	Bigfork	28		1937-1947	McGoldrick L Co	Benewah Cnty	35	3g 1r	1951-1955
Brooks-Scanlon L Co	Eureka	9	2g	1922-1926	Mecham L Co	Soda Springs	4	1	1913-1923
P L Howe L Mills	Eureka	9	3	(1919)-1922	Milwaukee Land Co	St Joe	9	2g	1917-1920
Eureka L Co	Eureka	12	1	1915-1922	Shoshone & Clearwater Ry	St Maries	3		1911-1928
Lincoln Lg & L Co	Fortine	9	1g	1911-1918	Milwaukee L Co	St Maries	36	4g 1r	1913-(1920)
Burlington L Co	Libby	6		(1912)	Alder Creek RR Co	St Maries	8		1913-1923
Casey Mining & Eqpt Co	Helena	8		(1951)	St Maries L Co	St Maries	7	2g	1915-
Columbia L Co	Columbia Fls	1		(1917)	Marble Creek Valley RR	St Maries	25		(1916)-1920
Donlan Co	Arlee	10	2g	1920-1928	Coeur d'Alene L Co	Coeur d'Alene	1		
Empire L Co	Kalispell	3		1926-1930	Mountain L Co	Wallace	11	1g	1926-1930
Enterprise L Co	Kalispell	2		(1913)	Norida Land & T Co	Sandpoint	2		1935-1938
E O Everson	Victor	5		1940-1947	Ohio Match Co	Coeur d'Alene	48	2g 2r	1921-1945
Harper Lg Co	Victor	12	1g	1927-1938	Panhandle L Co (1)	Spirit Lake	30	2g 1r	1909-1939
Heron L Co	Arlee	20	2g	1925-1933	Post Falls L & Mfg Co	Coeur d'Alene			(1912, 1915)
Hutchinson (Bros) L Co	Whitefish	2	1r	1909-1928	POTLATCH FORESTS, INC	Headquarters	99	19	1931-present
Isaacs L & Lath Co	Kalispell			1928-1929	Potlatch L Co	Potlatch	96	8g 2r	1907-1931
Jessup Milling Co	Jessup	2		1911-1917	Rupp-Holland Lg Co	Coeur d'Alene	8	1g	(1917)-1929
Hans Larson	Dayton	6	1	1934-	Edward Rutledge T Co	Coeur d'Alene	15	6g	1916-1931
Livingston & Cottrell	Plains	14		1938-1939	Elk Basin & Marble Creek RR	Bovill			1919-1931
Mann L Co	DeBorgia	11	1g 1r	1908-1925	Clearwater T Co	Orofino	30	5g	1927-1931
Montana Lg Co	St Regis	15	2g	1918-1943	Western States L Co	Caribel	8		-1918
J Neils L Co	Libby	25	4g	1918-1956	Federal Match Corp	Pierce	4	1g	-1927
Libby L Co	Libby	23	4g	1911-1918	V C Potter	Kooskia	7		1937-1947
(Chevelin-Hixon Co)					Rawson-Works L Co	Kamiah	3	1g	1913-1921
Dawson L Co	Libby	8	1g	(1910)-1911	Rogers L Co	St Maries	3	3	1931-1942
Polley's L Co	Ronan	11	2g	1911-1934	L J Root	Grangeville	2		(1910)
Pyfer's Sawmill	Whitehall	15		(1951)	Russell & Pugh (1) (2)	Harrison	6	1g	1904-1930
Sage L Co	Twin Bridges	1		1950-1959	Smith Creek L Co	Prairie	44		1934-1947
Sandpoint L & Pole Co	Troy		1g	1922-(1927)	G R Smith L Co	Kilgore	10		1951-1953
Somers L Co	Somers	47	1g 1r	1914-1942	Strobel & Grimm	Lane	6	1g	1907-
John O'Brien L Co	Somers	12		1901-(1910)	WASHINGTON, IDAHO & MONTANA RY CO	Potlatch	67	3g 3r	1906-present
F H Stolze Land & L Co	Columbia Fls	20	1g	1933-1946	(Potlatch Forests, Inc)				1931-present
State L Co	Columbia Fls	20	1g	1913-1933	(Potlatch L Co)				1906-1931
Tuscar L Co	Trout Creek			1917-1918	A C White L Co	Sandpoint	15	2g 1r	1909-1930
Warland L Co	Warland	20	3g	1924-1927	Winton L Co	Coeur d'Alene	29	6g	1918-1940
Baird-Harper L Co	Warland	18	3g	1910-1924	Stack-Gibbs L Co	Coeur d'Alene			1914-1918
A O Westburg L Co	Columbia Fls	3	1r	(1915)-1932	Winton-Rosenberry Co	St Joe	8	2g	1920-1923
W N Womack	W Yellowstone	4		1938-1940	Rose Lake L Co	Cataldo	8	1g	(1910)-1923
WHITE SULPHUR SPRINGS &	W Sulphur Spg	27	2	1910-present	Hoo Hoo RR	Cataldo	5		(1912)
YELLOWSTONE PARK RY					Hoo Hoo L Co	Cataldo	9	1r	(1906, 1912)
IDAHO									
Name	Location	Mile-age	Locomo-tives	Dates	NOTES				
Atlas Tie Co	Coeur d'Alene	1		1915-(1927)	1 — not in continuous operation				
C W Beardmore	Priest River			1918-	2 — originally narrow gauge and later standardized				
Blackwell L Co	Coeur d'Alene	32	5g	1909-1936	3 — pole road				
B R Lewis L Co	Coeur d'Alene	15	2g	1904-1909	4 — wood rail				
Coeur d'Alene Southn Ry	Coeur d'Alene	26	2g 1r	1909-(1913)	5 — tram road				
Ida & Northwest RR	Coeur d'Alene	30	2g 1r	1905-1909	6 — originally horse-drawn				
(B R Lewis L Co)				(1913)	7 — both narrow and standard gauge				
N P Bogle	St Maries				8 — electric road				
Boise Payette L Co	Boise	32	6g	1913-1946	9 — never in operation				
Intermountain Ry Co (1)	Boise	40	3g 2r	1914-1935	10 — acquired by Southern Pacific				
Boise Valley Ry Co	Boise			1905-	11 — acquired by Milwaukee Road				
Bonners Ferry L Co	Bonners Ferry	15	1	1907-(1915)	12 — acquired by Northern Pacific				
G A Branson	Mashburn	2		1915-1916	13 — acquired by Spokane, Portland & Seattle				
H E Brown T Co	Naples	1		1925-1926	14 — acquired by Great Northern				
Coeur d'Alene M Co	Coeur d'Alene	17	5g	1927-1928	15 — acquired by Western Pacific				
Cowger & Sons	Southwick	14		1934-1943	16 — acquired by San Francisco & Northwestern				
Craig Mtn L Co	Winchester	30	5	1910-1951	17 — acquired by GN and NP				
CRAIG MOUNTAIN RY	Winchester	8	2	1910-present	18 — acquired by Portland, Eugene & Eastern Ry				
(Boise-Cascade Corp)				1960-present	19 — acquired by SP and GN in 1928				
(Hallach & Howard L Co)				1951-1960	20 — acquired by Bellingham & Northern (Milwaukee Road)				
(Craig Mtn L Co)				1910-1951	21 — acquired by Oregon Short Line				
Winchester & Craig Jct RR					22 — owned by Southern Pacific				
Diamond Match Co (45)	Sandpoint	17	3	1927-1943	23 — equipment of Bayside L Co				
Burnt Creek RR				1924-	24 — sold to Pacific Gas & Electric Co				
Dollar Lg Co	Wallace			1913-(1915)	25 — later Caldor L Co				
Dover L Co	Sandpoint	7	1g	(1910)-1922	26 — became San Francisco & North Pacific Ry in 1898				
Downer Bros	Prairie	1		1953-1954	27 — leased line from Chico & Northern RR Co				
Grant L Co	Harrison	6	1g	1916-1919	28 — repurchased by Cottoneye L Co in 1911				
Hallack & Howard L Co	Cascade	10	2g	1927-1938	29 — leased HB&T from E&K 1904-1907; and from NWP 1907-1911				
Eccles L Co	Cascade	6	1g	1925-1927	30 — sold to Western Pacific in 1921				
Hedlund B & L Co	Worley	2	1g	1924-1926	31 — built by Dolbeer & Carson for horse-drawn cars in 1875				
Hopkins Bros	Enaville	3	2g	1926-1930	32 — sold to Siskiyou Electric Power & Light Co				
Humbird L Co	Harrison	5	1g	1929-1930	33 — bought by Long-Bell L Co in 1905				
Hutchins Bros L Co	Sandpoint	42	5g 2r	1907-1931	34 — sold by Weed L Co and became California & Northwestern				
Idaho Block Match Co	Pierce	12		(1953)	35 — sold to Redwood Paper & Pulp Co				
Idaho Northern RR (46) (21)	Sandpoint			1917-	36 — subsidiary of North Pacific Coast, both of which were taken over				
Lake Ry & L Co	Nampa	59	2r	1902-1912	by North Shore RR in 1902				
Boise, Nampa & Owyhee					37 — became a division of Pickering L Corp in 1925				
Ida & Wash Northern RR (11)	Coeur d'Alene	113	14	1907-1916	38 — sold by Terry L Co to Red River L Co in 1920				
					39 — leased to Big Basin Lg Co and later to Klement & Kennedy				
					40 — acquired by GN and NP				
					41 — leased to Sunset Lg Co in 1908				
					42 — owned by Blodgett Co and Crossett Western Co				
					43 — converted threshing machine locomotive				
					44 — began in 1908 under GN control				
					45 — E C Olson contractor 1927-1931				
					46 — operated under contract by Idaho & Washington Northern				
					47 — separate operation from Blanchard RR				
					48 — NP, UP, GN and Milwaukee Road each owned 16 per cent of stock				
					49 — jointly owned by Crown Zellerbach and Pabco Products				
					50 — gravity road without power				
					51 — incorporated as a Weyerhaeuser affiliate in 1910				
					52 — home-made locomotive with eight-foot gauge				
					53 — bought by NP in 1901				
					54 — sold to Laramie, North Park & Western RR Co				

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